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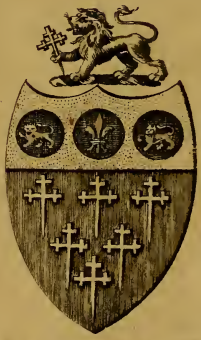
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To Dr. Butler

from ye Author

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CASES in SURGERY,

WITH

REMARKS.

PART the FIRST.

BY

CHARLES WHITE, F. R. S.
One of the Corporation of Surgeons in LONDON,
and Surgeon to the MANCHESTER INFIRMARY.

TO WHICH IS ADDED,

An ESSAY

ON THE

LIGATURE of ARTERIES,

BY

J. AIKIN, Surgeon.

LONDON,
Printed for W. JOHNSTON, in LUDGATE-STREET.
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TO

Dr. THOMAS WHITE

THESE

CASES

AND

REMARKS

Are Humbly INSCRIBED,

By his moſt DUTIFUL SON,

The AUTHOR.

PREFACE.

THE utility of a publication of real cases has been so well proved by some late excellent collections as to require no further evidence. It is, without doubt, the only way of determining what is of so much consequence in the practice of surgery, "Quid natura "faciat aut ferat."

THE present collection contains some remarkable instances of the surprising powers of nature in the relief of injuries offered to her, such

as theoretical reaſoning would ſcarcely allow us to hope for. They cannot therefore fail of being uſeful and agreeable to the followers of the healing art, if faithfully related; and I can aſſure the public that it has been my only aim to repreſent facts as they really were, not as they would tell the beſt.

SOME improvements of practice in caſes that frequently occur are alſo attempted, of which I ſhall only ſay, that I have been determined by their ſucceſs, not by a love of novelty, in adopting them, being well aware that nothing is a real improvement, in our profeſſion, but what, conſidered in all it's circumſtances and conſequences, contributes to a more eaſy, effectual, and ſpeedy cure.

I HAVE

I HAVE alſo in ſome caſes endeavoured to corroborate the obſervations and improvements of others in points of practice, which do not frequently fall under the inſpection of one man, and therefore require the united confirmation of others; and it is to be wiſhed that men in every ſcience would, as much as poſſible, diveſt themſelves of that illiberal ſpirit of prejudice and jealouſy, which is too apt to prevent the mutual aſſiſtance which they owe to one another, and to the public.

IN the remarks ſubjoined to theſe caſes I have been very cautious of drawing inferences from a too abſtruſe and ſpeculative reaſoning upon the fact, but have rather choſen to confine myſelf to the moſt obvious and

ſimple deductions from the event of the caſe.

SEVERAL of theſe caſes and remarks have been already publiſhed, ſome of them in the Philoſophical Tranſactions, and others in the Medical Obſervations and Inquiries: but I imagine it will be full as agreeable to the readers to ſee them all together in one volume, eſpecially as ſome of them are connected with theſe now firſt publiſhed, and they help to confirm each other. I have likewiſe ſelected ſuch caſes from a number which my father took minutes of when he was in full practice, as are ſimilar to thoſe of my own, which I have now tranſcribed for publication.

THE

THE few caſes I have here given of the ſtopping of bleeding arteries by ſponge, are not intended to ſhew it's utility in all hæmorrhages whatſoever, but in thoſe where the ligature could not poſſibly be made uſe of, or in ſuch as had reſiſted the the moſt approved methods of practice, and of conſequence brought the life or limb of the patient into danger.

I PROPOSE to give the public a ſecond part of this work, as ſoon as my avocations in buſineſs will permit me, and am ſufficiently furniſhed with materials for that purpoſe.

I HAVE only to beg that thoſe who find any thing to cenſure in the ſtyle or compoſition of theſe papers would

would be pleaſed to conſider that they were drawn up in the hurry of an extenſive and fatiguing practice; and I hope the public will receive them, as being at leaſt the well-meant efforts of one who wiſhes nothing ſo much as the improvement of his profeſſion, and the general welfare of mankind.

MANCHESTER,
MARCH 10, 1770.

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CASES

CASES

IN

SURGERY, &c.

An Account of a new Method of amputating the Leg a little above the Ancle Joint; with a Deſcription of a Machine particularly adapted to the Stump.

IN diſorders of the ancle which require amputation, I have often, with regret, robbed the patient of a great deal of the ſound part of the limb, by conforming to cuſtom, and amputating in the uſual place a little below the knee. For though in all other

amputations ſurgeons endeavour to preſerve as much of the limb as poſſible, yet the difficulty which was found of adapting artificial legs to the ends of the ſtumps, and the inconveniencies which attended ſuch long ſtumps when they were fixed to the bended knees, made this practice very general: not that there have been wanting ſurgeons who have performed the operation in the lower part of the limb and contrived artificial feet to walk upon, particularly in the laſt century Verduin, Solingen and Dionis. It is no wonder this practice ſhould ſoon fall into diſrepute, when the ſurgeons of thoſe days were unacquainted with the double inciſion, when the flap operation was not brought to perfection, and their machines were, in compariſon of ours, complex, rude, and heavy.

The following circumſtances fixed me in the reſolution of operating in this part. At the latter end of the year 1760 I happened to ſee a woman who had her leg taken off a little above the ancle twenty years before, by advice of her brother, who was

a carpenter, and had promiſed to make her a wooden leg of his own contrivance. The ſurgeon at firſt refuſed to amputate in this place; but being told that if he would not they would apply to another, he conſented to do it contrary to his own opinion. The operation was performed by the ſingle inciſion: the ſtump was twelve months in healing, and the ſurgeon died before the expiration of that time. Her brother made her the wooden leg as he had promiſed, and a wooden one it really was to all intents and purpoſes; but notwithſtanding all theſe diſadvantages, ſhe declared ſhe would not have had it taken off in the uſual place upon any account whatſoever, as ſhe found ſhe had ſo greatly the advantage of others who had ſuffered amputation in the common manner. Indeed ſhe herſelf had, for a little while, worn a common wooden leg fixed to her bended knee, but ſoon threw it aſide in favour of the other, which gave her the free uſe of her knee joint in flexion and extenſion. I was myſelf fully convinced of the utility of this method from her great activity, both in walking upon

level ground and in going up and down ſtairs, and I had not a doubt, both that a better ſtump might be made, and a more convenient machine contrived.

THE firſt opportunity I had of operating in this part was on Auguſt 10, 1761, upon William Slater, whoſe caſe I have related in my account of the uſe of the ſponge in the ſtoppage of hæmorrhages, Caſe IV. I purpoſely omitted at that time mentioning any thing of the method of operating, as it was foreign to my intent in that publication, and as I fully propoſed giving it to the publick as ſoon as experience had enabled me to ſpeak with greater certainty. I performed it by the double inciſion, beginning the firſt as near the ancle joint as I could, in order to make as long a lever as was poſſible, and hereby give him a greater power in walking. The ſtump was healed in about three months; he died of a conſumption ſoon after, ſo that I had no opportunity of trying the walking machine which I had invented.

THE next leg which I amputated a little above the ancle was that of James Oates, a patient in the Infirmary, on September 1, 1761, whoſe caſe is likewiſe related in the ſame pamphlet, Caſe IX. This I did not take off quite ſo low as the former, by which I thought to make a better ſtump, as there would be rather more ſubſtance in the lower part of the muſcles, than in the Tendo Achillis, from whence granulations of fleſh would be more likely to ſprout up. This method fully anſwered my expectations; the ſtump was intirely healed in ten weeks, and was not in the leaſt pointed, but perfectly flat at the end, when it was fitted with a machine, *vide plate*, I. ſimple in it's contrivance, and of an eaſy expence. After this I took off ſix others in the ſame manner, and had the ſatisfaction to ſee them all fully anſwer my expectations. I afterwards recommended this method to ſeveral gentlemen both in London and in the country, and found, with pleaſure, that they were equally ſucceſsful; nor did I ſee that any improvement could be made in this operation till the latter end of the

year 1765, when Mr. O'Halloran, a ſurgeon, at Limerick in Ireland, publiſhed his *Complete Treatiſe on Gangrene and Sphacelus*, with a *New Method of Amputation*, which is an improvement of the flap operation.

THE flap operation was originally an invention of Lowdham, an Engliſhman, and publiſhed by Jacob Young, in 1679 in his *Currus triumphalis ex Terebinthino*; it was afterwards practiſed by ſeveral French, German, and Dutch ſurgeons; but being from many trials found inſufficient it was diſuſed. The merit of bringing the flap operation to perfection was reſerved for Mr. O'Halloran, and he is juſtly entitled to the thanks of the public for it. The chief alteration he made, was inſtead of uniting the flap immediately, to defer it till the 10th, 12th, or 14th day, and to dreſs the extremity of the ſtump and the flap as diſtinct and ſeparate ſores till that time, when all inflammation will have ſubſided, the rough edges of the bone will be covered, and the ſuppuration will be completely eſtabliſhed; and on this circumſtance alone the

the ſucceſs depends. He had not, when his treatiſe was publiſhed, operated in this manner more than three times; and his amputations were all of them thoſe of the leg in the uſual place below the knee. He indeed very ſtrongly recommends this method in amputating the thigh, arm, and forearm, and has laid down plans for the operation. He moreover ſays (p. 266.) "In the common method a diſorder even "of the foot makes amputation near the "knee neceſſary, becauſe here the wooden "leg reſts; but in this you may cut "lower down, as the extremity of the "ſtump may reſt in the hollow of an ar-"tificial leg, which the cuſhion of fleſh "enables it to do, and the remains of the "limb will have the power of bending "and extending as freely as ever."

I TRIED the flap operation in the firſt caſe I had, after reading Mr. O'Halloran's treatiſe, in which amputation in the lower part of the leg was adviſeable. I began my inciſion where the Tendo Achillis is inſerted into the Os Calcis, and with one

ſtroke of a ſtrait knife cutting obliquely upwards for about three inches, I formed the flap, in which the Tendon was included; then with one ſtroke more of the ſame knife by a ſemicircular inciſion, I cut down to the bones at once. After the operation was finiſhed, the ſtump and flap were dreſſed ſeparately; the flap was laid gently up to the end of the ſtump, and kept from coming into contact with it by the intervention of the dreſſings; which were renewed in the ſame manner as often as was neceſſary to prevent it's being offenſive, till the 12th day, when the flap was laid up to the bare ſtump, and retained there by ſlips of good ſticking plaiſter. In a few days it was evident that the flap began to adhere; and the ſtump was perfectly healed in leſs than two months; though the patient was detained a little longer in the infirmary to have a machine fitted to his ſtump.

When I firſt began to amputate in this part in the year 1761, and for ſome years after, I was very cautious in preventing the end

of the ſtump from preſſing upon the bottom of the ſocket that contained it; but after performing the flap operation, I found my cautions unneceſſary, as the patients, before they left the infirmary, could put the ends of their ſtumps to the ground, and reſt their whole weight upon them.

A Liſt of the Perſons upon whom I have performed the FLAP OPERATION *a little above the Ancle.*

	Age.	when performed.	when diſcharged.
		1766	1766
Robert Thornton —	21	March 26	June 2
Edward Serles —	11	May 16	Aug. 4
Robert Wood —	62	July 26	Oct. 20
Alice Barlow —	40	Aug. 1	Nov. 20
		1768	1768
Robert Brierly —	26	May 12	Aug. 15
Ralph Mort —	20	June 17	Aug. 22
Mr. Jonath. Jackſon, merchant, Lancaſter	27	Sept. 22	Died about a month after
		1769	1769
Robert Kerſall —	16	July 5	Oct. 16

MR. JACKSON was in the laſt ſtage of a conſumption when the operation was performed; but as we often ſee ſurpriſing recoveries, when the diſorder is occaſioned by abſorption, after the removal of the cauſe,

cauſe, we were willing to give this poor gentleman all the chance we could. *Anceps remedium ſatius eſt experiri quam nullum.* The caſe however certainly turns out in favour of the flap operation, for the flap was perfectly united before his death, which happened in a month after, and, as he might be ſaid to be in a dying condition, I think we need not deſpair of the union of the flap in any caſe whatever.

REMARK.

NOTWITHSTANDING the very great improvements that have been made in ſurgery within theſe few years, and all which Mr. Bilguer has ſaid in his treatiſe of the inutility of amputation, that operation ſtill is, and I am afraid will often be, found adviſeable. Not that I am an advocate for it in any caſe, but where it is neceſſary to ſave the patient's life, or where the limb is become quite burthenſome, and I muſt ſo far join with that gentleman as to believe it is ſometimes unneceſſarily performed; but it is to be hoped that the daily improvements in the art will remove the

cauſe

cauſe of this reflection, and that every attempt to leſſen the inconveniences neceſſarily attendant upon the loſs of a limb, will be well received by the public; and not conſtrued into a deſire of multiplying operations for a ſpecious ſhew of dexterity, ſince it certainly redounds more to the honour of a ſurgeon to ſave one limb than to take off a hundred.

It is further to be obſerved, that all the patients here mentioned were afflicted with diſeaſed joints, from a ſcrophulous habit, which is extremely prevalent in this country, and renders a ſtump more tedious in healing, than moſt of the diſorders requiring amputation.

In making the ſemicircular inciſion in the forepart of the leg, I have uſed the double inciſion as well as the ſingle one, and I am rather inclined in favour of the double one, which makes a better ſtump, is ſooner healed, I believe cauſes very little additional pain, and indeed in ſome caſes, where, from particular circumſtances the

flap

flap cannot be made large enough, is abſolutely neceſſary.

It is likewiſe to be remarked, that in all caſes wherein I have performed the flap operation, the veſſels were ſecured either by ligature without the needle, or by ſponge. It would be imprudent to uſe the needle, as we are not certain of removing the ſtitches in proper time, and ſometimes in tendinous and membranous parts are not at all able to do it without cutting it, which is always attended with pain and trouble, on account of granulations of fleſh which ſprout up and cover it; and it would not be adviſeable to unite the flap till the ſtitches are removed, as I have ſometimes ſeen troubleſome conſequences, and have known the cure rendered very tedious in a common amputation, from a ſingle ſtitch remaining; but when the veſſel has been drawn out by the forceps or tenaculum and included in the ligature alone, the ligature has generally fallen off before the time of uniting the flap, and if it does not, it is certain in a little while to come away without any art.

Caſes

Pl: 1.

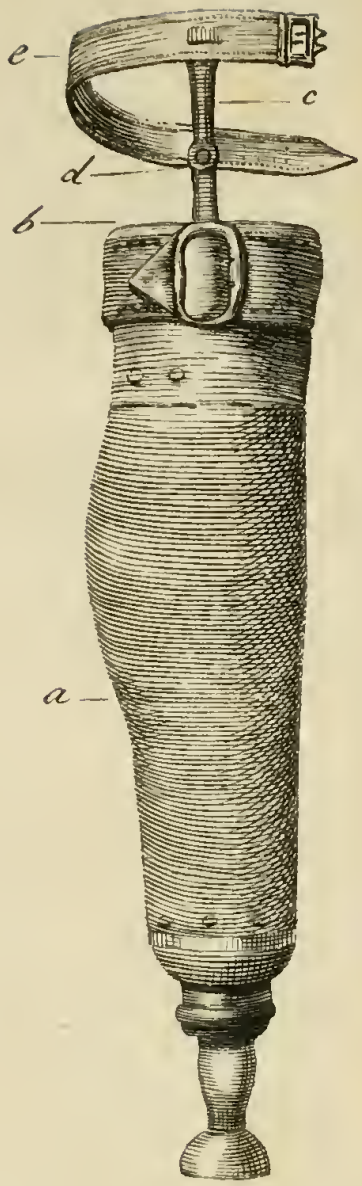
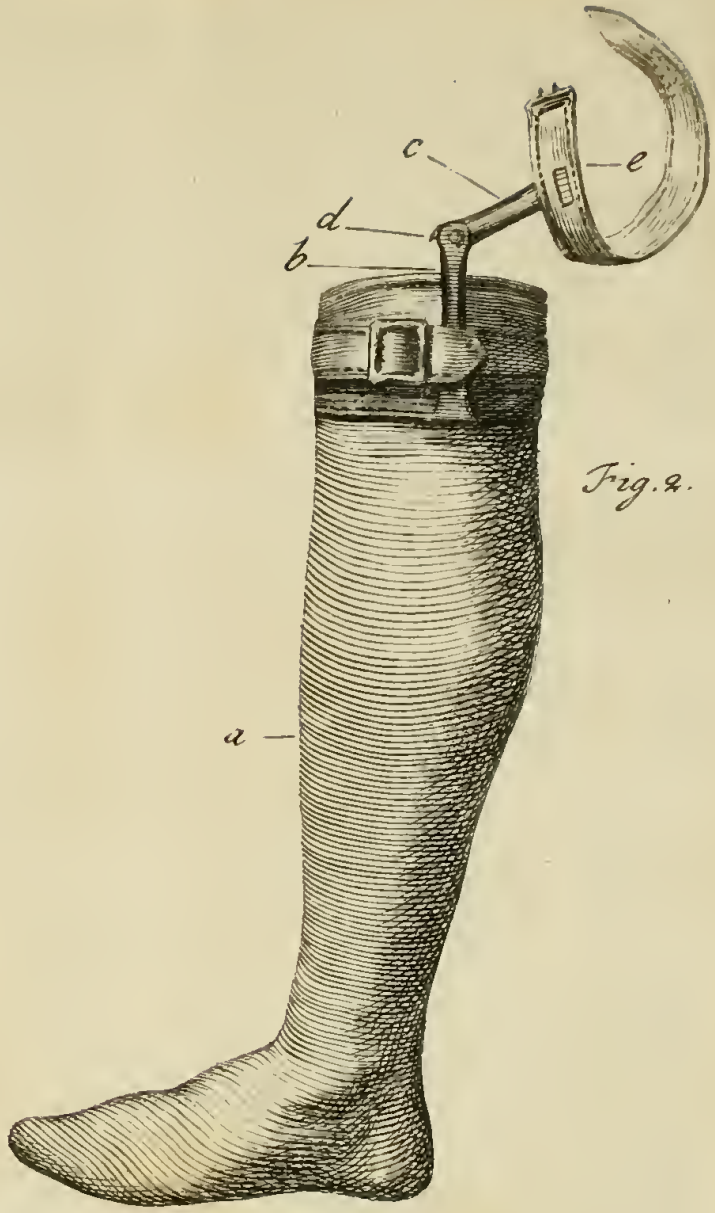


Fig. 1.



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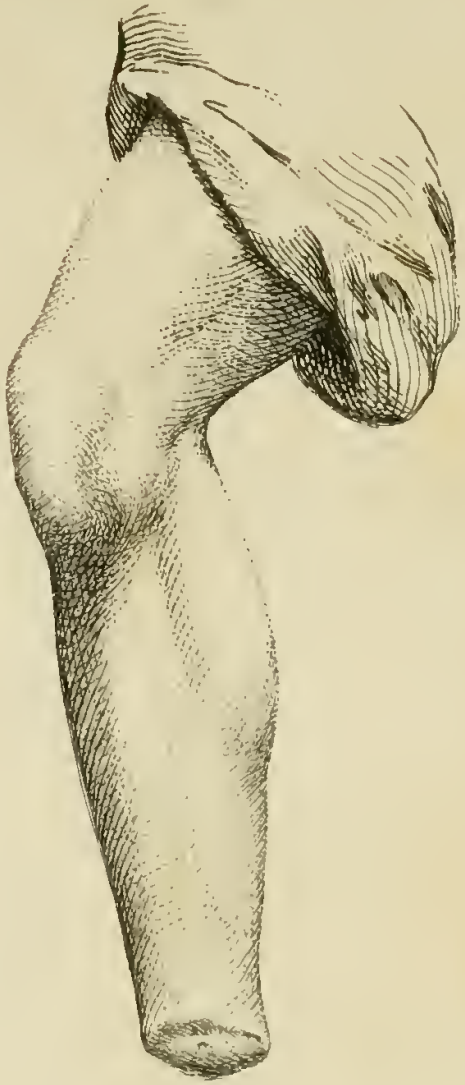
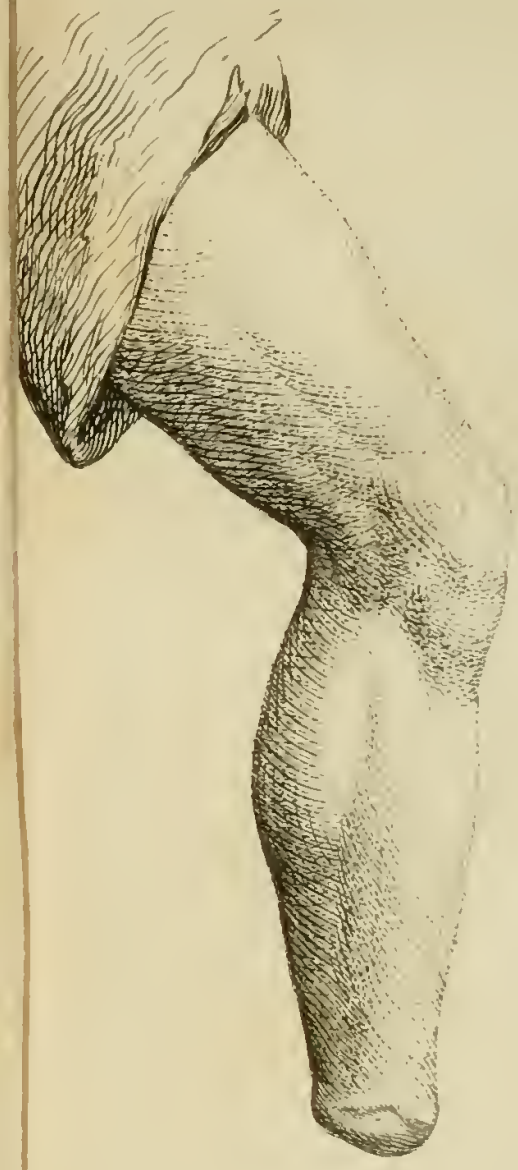




Caſes of Accumulation of Fæces in the Inteſtines.

MARTHA OGDEN, of Oldham, aged fifteen years, was admitted into the Infirmary, November 17, 1760, for a ſuppoſed tympany, with which ſhe had been afflicted a little above three months. Her abdomen was ſo much diſtended that her diſorder had greatly the appearance of an aſcites, and tapping was propoſed. To this I objected, both becauſe no fluctuation could be perceived, and on account of ſome other particulars of her caſe, which upon a ſtrict enquiry were as follows: For ſeveral ſucceſſive ſummers, about the month of Auguſt, ſhe had been ſeiſed with great coſtiveneſs, and tumefaction of the belly, which continued till cold weather came on, when ſhe had copious diſcharges by ſtool, which perfectly relieved her till the ſame time of the year returned. But at this time nature was not able to relieve herſelf. Her belly was increaſed to an enormous ſize, and the

poor

poor girl was become ſo extremely weak when brought to the Infirmary, that nothing was done for her. She ſtaid only a week there, was diſcharged at her own requeſt, and died three days after. I had ſeen her but once (ſhe not being my patient) and then propoſed an examination of the rectum, in order to find whether any thing obſtructed the paſſage. This I learned was afterwards done, but only by the nurſe, and nothing was diſcovered.

Her friends acquainted me with her death, and gave me the liberty of opening the body. Buſineſs prevented me from going myſelf; but I ſent a young gentleman, who was at that time my apprentice. On opening the abdomen he found no great quantity of either air, or water, but an accumulation of excrements which had diſtended all the inteſtines, and particularly the colon, which was thicker than his thigh. After taking out moſt of the excrements, which filled a veſſel containing betwixt three and four gallons, a ball was found bigger than both his fiſts, and weighing

ing eight ounces. He brought it home, and, upon cutting through it, I found it conſiſted entirely of hardened fœces.

It is to be regretted this poor girl did not apply for relief ſooner, as her life might have been preſerved, and her complaints entirely removed, ſince there were ſufficient indications to point out the cauſe of her diſorder. I have met with three other caſes of the ſame nature, but not of ſo long ſtanding.

The firſt was of a gentleman of fortune, upwards of ſixty years of age, who had ſuffered ſome weeks from a retention of his excrements. He had formerly been much troubled with the piles, which having brought on frequent inflammations, had contracted the ſphincter ani. I broke into the hardened fœces with a ſcoop, and brought away as much as I conveniently could. I ſpent moſt of the day in throwing up, with a large ivory ſyringe, injections, conſiſting of the yolks of eggs and olive-oil, till I thought the hardened excrements were diſſolved; after

after which I prescribed a purgative glyster that fully answered the intention, bringing away with it a whole close-stool full of excrements, which, with what had been before taken from him, and what followed the next day, entirely relieved my patient, who has never since been troubled with any complaint of this nature.

The other cases were nearly similar, and the afflicted persons were relieved by the same methods. See a case of the same kind in Gooch's collection, p. 160, second edition.

Dr. Rutty, in his treatise on the urinary passages, page 52, quarto edition, gives the following quotation from Dr. Bamber. "A great quantity of "tophaceous substances, that seemed to me so many "globules of hardened excrements, were lodged in "the beginning of the colon, where the ileum is "ingrafted, and pressing upon the fundus of the "bladder, created symptoms which aped the stone "so nicely, that only death and dissection there-"upon detected the fallacy. In this case it was al-"most impossible but the most skilful surgeon should "be deceived; for these concreted substances gave "the same resistance to the catheter, and caused the "same sensation to the hand, that a stone would when "in the cavity of the bladder."

Cases

Caſes of Plumb-Stones, retained in the Inteſtines.

IN July 1760, Thomas Fogg, of Clyſton, about twenty years of age, had been ſeveral years ſubject to great pains in his ſtomach and bowels. His diſorder was differently treated by ſeveral of the faculty without any relief; but after he had left off all medicines for about a year and half, he voided, by ſtool, fourteen round ſpongy balls of different ſizes, from the bigneſs of a nutmeg to that of a potatoe. Some of them being cut in pieces, were found to have plumb-ſtones in their centers.

JAMES CHORLTON, of Clyſton, aged forty, was troubled with very ſevere pains in his ſtomach and bowels, with a diarrhœa, and violent vomitings of blood and mucus. Theſe complaints returned frequently at uncertain periods for fourteen or fifteen years. About ſix years ago in one of theſe fits of vomiting, he threw up twenty-three plumb-ſtones, and parted with ſeveral others by ſtool. They were juſt glazed

over with a hardened mucus. He imagines they had lain in him ſeveral years, as he frequently eat plumbs ſome years before, and ſometimes ſwallowed the ſtones; but was certain they muſt have ſtaid with him at leaſt eleven months; for he had never eat a plumb during that time. As his complaints have continued ever ſince without any remarkable alteration, except that of his being reduced to a weaker and lower condition, he apprehends, with too much reaſon, that there are ſtill more plumb-ſtones lodged within him.

On March 2, 1762, Dr. Brown, a very ingenious phyſician of this place, deſired I would viſit I. Parkinſon, of Mancheſter, an out-patient of the Infirmary, who had been ſome time under his care for complaints much reſembling nephrytic paroxyſms, which the medicines uſual in ſuch caſes had frequently relieved. The night before he had perceived a lump in the rectum which had brought on a continual teneſmus. I found him extremely emaciated; the ſphincter ani very much dilated

lated, with a continual diſcharge of thin, excrementitious and very fœtid matter. Upon introducing my finger into the anus, I very diſtinctly felt a large body, moveable in the rectum, which I eaſily took hold off with a pair of forceps, ſuch as are uſed in lithotomy, and immediately brought away without much difficulty. It was a ball nearly as big as my fiſt; and, breaking in the extraction, diſcovered a plumb-ſtone in the center, which was it's nucleus. Upon further examination, I found there was another, which I extracted entire, nearly as large as the firſt. The patient recovered very faſt, and in a month's time was a hearty ſtrong man.

A. B. of Chowbent, a young woman of about twenty five years of age, had, for ſeveral years, been troubled with ſevere pains in her bowels, ſometimes attended with violent coſtiveneſs, and at other times with an obſtinate diarrhœa. She was greatly emaciated, and reduced ſo low as ſcarcely to be able to walk over the floor. She complained of great pain about the anus,

and an involuntary diſcharge of thin fœces, which were extremely offenſive. The ſphincter ani was much dilated. I introduced a thick probe into the rectum, and plainly felt a large round ball. I was perfectly convinced that this was a ſimilar caſe to that I have juſt related; when, introducing a pair of large forceps I eaſily extracted a round ball, weighing about four ounces; and after that another of an oblong form, but nearly of the ſame weight *. Her ſtrength and ſpirits ſoon returned, and ſhe was reſtored to her former health. Upon cutting open one of theſe balls a plumb-ſtone was found in the center.

REMARK.

CASES of this kind are not very uncommon, and are related by ſeveral authors. My intention in publiſhing theſe is not only to inform young practitioners, but to warn mankind in general of the great danger which attends the ſwallowing of the ſtones of fruit; and I doubt not but many

* Vid. plate III. fig. 1 and 2.

have

have loſt their lives from this cauſe, when the diſorder has not been known, but miſtaken for the cholic. Parents would do well to warn their children of the danger they incur by this practice; and I cannot help mentioning a ridiculous notion among the common people, that ſwallowing the ſtones helps the fruit to digeſt.

For a further particular account of ſimilar caſes, ſee Philoſ. Tranſ. abridged, vol. v. p. 256, & ſeq. Edinburgh Med. Eſſ. and Obſerv. vol. i. p. 301. Ibid. vol. v. p. 431. Eſſays Phyſ. and Literary, vol. ii. p. 345. Dr. Leigh's Natural Hiſtory of Lancaſhire, plate 1, fig. 4.

Fig. 1.

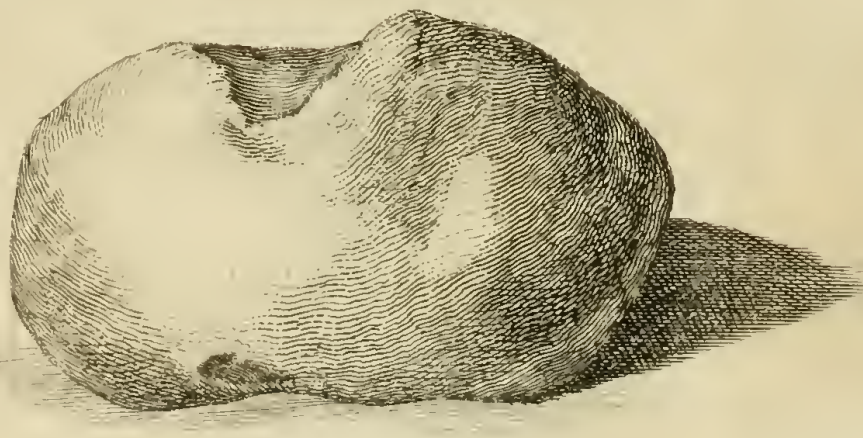
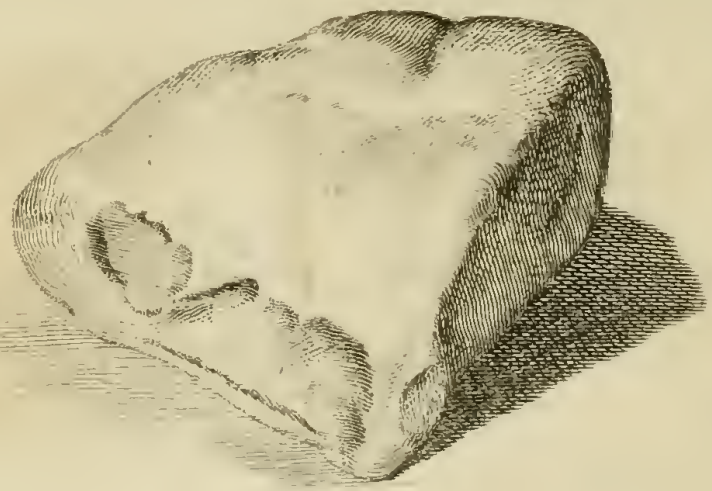


Fig. 2.



A Caſe in which five ſpongy Balls, containing each a Cherry-Stone in their Center, were extracted from the Anus, by Dr. Thomas White.

ON Auguſt 20, 1725, I ſaw a young man at Taxwell in Derbyſhire, who had been for four months troubled with a violent cholic and looſeneſs, which had reſiſted all the means that had been uſed by a country apothecary. He was reduced almoſt to a perfect ſkeleton; he had a cadaverous look, and the moſt horrid ſtench about him that I ever ſmelt. He was ſo weak that, though ſenſible, he was unable to make any reply to my queſtions; and, for two months paſt, had been incapable of ſtirring from the poſture he lay in. His excrements came from him involuntarily. He had not one ſound part about his hips and buttocks to lie on, being excoriated up to the back-bone, by the ſharpneſs of the filthy matter that was diſcharged from the anus. Upon a further enquiry I diſcovered, that he had lately complained of a tumour in ano. I therefore deſired that he might, if poſſible,

be put in a proper poſture to view it, which was accordingly done. The ſphincter of the anus ſeemed to be quite conſumed, and the paſſage was ſo much dilated, that I could ſee ſeveral inches up the inteſtinum rectum, and in it a large tumour, which I felt with the handle of a long ſpoon, and found to be a moveable body. I introduced my hand with no great difficulty; and though it was a large ſpongy ball, I eaſily extracted it, and after that another as big, with three ſmaller ones. The biggeſt weighed four ounces, the others two ounces each; they conſiſted of an excrementitious ſubſtance, and had each a cherry-ſtone in their center.

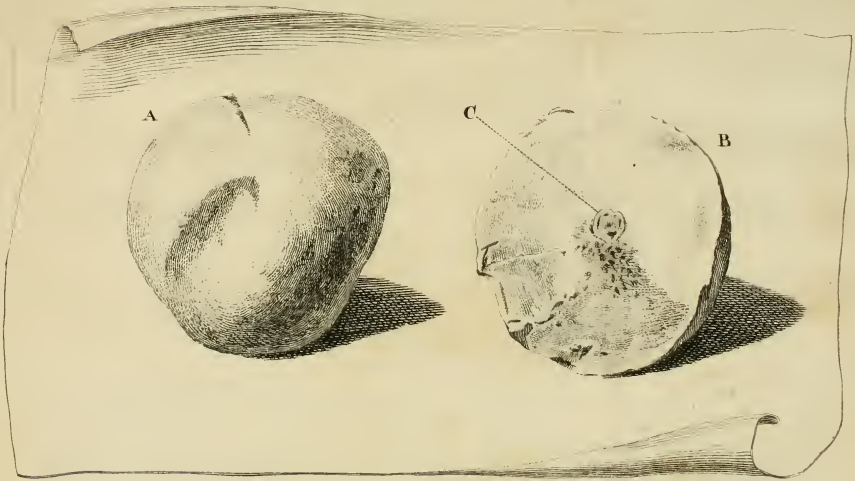
I ORDERED an injection of *ſp. vin.* and *mel. Egypt* to be thrown up three or four times a day, and proper dreſſings to the external parts. The patient perfectly recovered, and ſix months after I ſaw him a healthy young man.

PLATE

PLATE IV.

One of the larger balls of the exact ſize, after being dried, which diminiſhed it greatly.

A The ball entire.
B The ball cut in two.
C The cherry ſtone in the center.


A
C
B

An Account of two Stones, which, upon diſſection were found in the Colon, by Dr. Thomas White.

A GENTLEMAN's ſervant of this town, aged ſeventeen, applied to me on account of the following diſorder. About four years before, he had been ſeized with a ſudden lameneſs in his right thigh, and complained of a pain in his hip, which gradually grew worſe. About two years after, he was attacked with ſtitches in the right hypochondre, attended with a fever, which was treated by his apothecary as pleuretic. He was afterwards afflicted with violent cholic pains, and with *borborygmi*, ſo loud as to be diſtinctly heard into another room. Tumours ſuddenly appeared on different parts of the abdomen, which as ſuddenly diſappeared, and always went off with a looſeneſs. He was the moſt emaciated ſubject I ever ſaw; and, as he died ſoon after, I had the liberty of opening him. Upon elevating the ſternum, I found the lungs adhering to the pleura,

no

no water in the pericardium, the heart ſomething bigger than uſual, with a polypus in the left ventricle. On examining the abdomen I found the liver to be increaſed to three times it's natural ſize, it was of a good colour, ſeemed to be loaded, but not ſchirrous, and adhered cloſely to every thing about it. The gall-bladder contained a proper quantity of gall. The ſtomach was ſo diminiſhed that it ſeemed but one continued tube from the œſophagus to the duodenum. The inteſtines were of an uncommon whiteneſs, curiouſly ſpread with blood veſſels, and as full as if they had been injected; they had very little alimentary or excrementitious matter in them, but were filled with air. In turning them over, about four inches before the valve of colon, I felt a very large ſtone; and about a hand's length diſtant another ſtill larger. In cutting them out I found the cœcum and the beginning of the colon adhered to the peritonœum: after freeing them I diſcovered an abſceſs in the interſtice betwixt the iliac and pſoas muſcles of the right ſide. One of the ſtones weighed two ounces, the other

one ounce and an half. I broke the leſſer, and found the external ſtratum as perfectly petrified as that of a ſtone in the bladder; the reſt of it, as it approached the center, appeared to be more ſpongy, like concreted excrements, but no fruit ſtone, as is common, was in the middle of it. There were two chalk-ſtones in the meſentery.

A very

A very large Tumour of the Scrotum, occaſioned by a diſeaſed Teſticle, and accompanied with a Hernia Inteſtinalis, cured by an Operation.

ABOUT five years ago I was ſent for to T. B. a farmer, near Leigh, in this county, of upwards of ſixty years of age. He had a large tumour in the ſcrotum that reached down to his knees, and was thicker than his waiſt, which he apprehended began in his right teſticle. It had been twenty years in growing to that ſize, and had for ſome years paſt occaſioned great difficulty in walking. A few weeks before, the tumour had ſuppurated and burſt, and continued to diſcharge a very offenſive matter in great quantities. He had likewiſe from his youth been troubled with a hernia of the ſame ſide. The penis and the other teſticle were buried in this tumour, which appeared to be a confuſed maſs of putrid fleſh. The diſcharge had brought on hectic ſymptoms, and he was now confined to his bed, ſeemingly in the

laſt ſtage of a conſumption. I informed his friends that there was no chance but from an operation, and that but an indifferent one, as his age and extremely weak ſtate rendered him but very unfit to bear an operation that muſt neceſſarily be ſevere and tedious, from the great deal of diſſection requiſite to preſerve ſo many parts of conſequence. It was however conſented to, and I began with a longitudinal inciſion, made very cautiouſly, in order to diſcover the contents. I found that the inteſtines occupied the upper part of the tumour, in as large a quantity as would have filled a hat crown; and that the lower part appeared to conſiſt of the right teſticle, larger than a man's head, and hollow within. I reduced the inteſtines through the rings of the abdominal muſcles, and retained them by a ſtitch through the teguments. I then proceeded to diſſect away the tumour, and left the penis and other teſticle entire. The blood veſſels were ſecured by dry ſponge, and the common dreſſings and bandage were applied. The wound went on very happily; he continued

nued to gain ſtrength daily, and is now as hearty and ſtrong a man as moſt of his age, not ſuffering the leaſt inconvenience from the diſorder. I however adviſed him to wear a truſs, to prevent the inteſtines from puſhing down to the cicatrix.

My father has favoured me with the following nearly ſimilar caſe.

An Account of an enormous Tumour of the Scrotum ſucceſsfully extirpated, by Dr. Thomas White.

JULY 20, 1725, I was ſent for to Mr. Warrington, of Whaley-bridge, in Cheſhire, a very tall, ſtrong, luſty man, aged ſeventy-two. About twenty years before, he had perceived a hard tumour in his right teſticle, which had, ſince that time, gradually increaſed to ſuch an enormous bulk that he could not, without the greateſt difficulty either ſit or walk. At laſt the pain occaſioned by it's tending to ſuppuration, together with a fever, obliged him to keep his bed. He likewiſe complained very much of a pain in his loins, and a difficulty of making water, together with great coſtiveneſs. When the bandage by which the tumour was ſupported from his neck was taken off, I viewed it, and found the ſcrotum to meaſure, from the os pubis to the bottom, near thirty inches, and apparently capable of containing five or ſix gallons. The penis was intirely buried in the tumour, a ſmall

hole, not unlike a navel, remaining for the diſcharge of the urine. The tumour had burſt of itſelf in the moſt depending part, and the people about him had catched a gallon of reddiſh matter, with a red ſediment, beſides what was loſt in the bed, and upon the cloaths.

Upon examination with a probe, I found a large putrid body, that proved to be the right teſticle in a corrupted ſtate, grown to the ſize of a child's head, which blocked up the orifice, and hindered the diſcharge of the matter. I dilated this orifice with a pair of crooked ſciſſars, and two gallons more of the ſame matter were diſcharged, together with the teſticle, which I eaſily took out. It's internal ſubſtance was of a bright red colour. After taking up an artery, which had been divided, I filled the cavity with tow, well moiſtened with *ſpirit of wine* and *mel. Egypt.* made warm, and applied the proper dreſſings. He reſted very ill that night, and a great quantity of thin purulent matter was diſcharged. His pulſe was unequal and trembling,

trembling, the affected parts were cold, and this large bag, which the day before was three fingers thick in the bottom, callous, and rigid, in the morning was become quite flaccid. All these symptoms strongly indicating a mortification, I forewarned my patient and his friends of the danger, in order that extirpation might immediately take place. This being consented to, I proceeded in the following manner: I introduced my hand and arm beyond the elbow, by the incision that was already made, in order to find the penis, and preserve it unhurt; I then divided the sac from it's base to the hole where the urine was discharged, and dissected the skin round the penis, preserving as much of it as possible towards the os pubis, that the surface of the wound might be lessened. I finished with cutting off both sides from the groin. He bore this tedious operation with the greatest fortitude, and the whole wound was cicatrized in two months. The penis was restored to it's natural figure; and notwithstanding his long illness, his advanced age, and the

great diſcharge of blood and matter, he perfectly recovered a vigorous ſtate of health.

It is worthy of obſervation that the ſpermatic veſſels on both ſides had degenerated into ligaments, and did not diſcharge a drop of blood. The left teſticle was ſoft, flaccid, and increaſed, to near the ſize of a horſe's. It was affected with a perfect hydrocele. The whole maſs of fleſh, after the operation, weighed eight pounds.

This caſe ſeems parallel to that of the negro, of which Mr. Cheſelden has given a figure, with the following deſcription in his anatomy, edit. 4. tab. 26.

" The lower parts of a negro whoſe " ſcrotum was ſwelled to this ſize, from a " kick, (the ſpermatic veſſels being not " at all thickened) the greateſt length " was twenty-ſeven inches, and the great- " eſt horizontal circumference forty-two " inches. He was the late Mr. Dicken-

" ſon's

" ſon's patient in St. Thomas's hoſpital.
" The tumour was ſolid, without inflam-
" mation or pain, but what parts were
" affected we could not learn, he not
" ſtaying for the operation. At the dark
" place he could pull out the penis, when
" the ſcrotum was lifted up."

In a converſation I had ſome years after with Mr. Cheſelden, he was much pleaſed with my relation of the above caſe, and regretted very much the negro's running away out of the hoſpital, and depriving him of the opportunity of ſeeing the event.

Tumours on new born Children.

BETTY SEDDON, of Eccles, in this county, aged thirteen months, was admitted an out-patient of the Manchester Infirmary, June 8, 1761. She was born with a claret-coloured tumour upon her forehead, which was at first no larger than than a pea, but had increased so fast as now to be full as large as an hazel nut, and, when she cried, was distended to to the size of a walnut. After a strict examination I was of opinion that it might safely be dissected out, and I immediately performed the operation: three arteries, which supplied the tumour, bled freely, but were easily stopped by the application of a piece of soft spunge. I examined the tumour after taking it off. It appeared not to be of the encysted kind, but of a substance much like the corpus cavernosum penis, which enabled me to account for it's greater increase, when the reflux of the blood was impeded by the child's crying. I removed the dressings and sponge on the fourth day, the cure went on very happily,

and

and nothing remarkable happened. I have ſince taken out ſeveral other tumours of the ſame kind, and with the ſame ſucceſs. For a ſimilar caſe, ſee Warner's caſes in ſurgery, p. 123.

About fourteen or fifteen years ago a young child was under my care in the Infirmary, with a tumour on it's back nearly as big as a middle ſized pear, which it was born with. The tumour was ſoft, with a perceptible fluctuation, and viſibly replete with a tranſparent fluid.

Upon a cloſer examination a defect might be diſtinctly felt in the back-bone; and it is from hence that tumours of this nature are called *ſpinæ biſidæ*. They may occupy any part of the ſpine, or back part of the head; as they have their origin from the brain or ſpinal marrow, and are contained in a cyſt, which is an elongation of the dura and pia mater, and the membrana arachnoides. Their contents are a fluid, ſeparated by the brain, cerebellum, and ſpinal marrow. I adviſed the parents of

of this child by no means to have it opened, but to keep it properly and gently supported. I told them it was uncertain how long the child might live, some in this situation dying very young, while others lived to man's estate; but that none ever survived the extirpating, or even the opening them.

TULPIUS expresses his opinion of this very strongly in his observations, chap. 29, book 3, "Quam calamitatem, siquidem "reformides chirurge, cave sis improvide "unquam aperias quod tam facile occi- "dit hominem." This is further confirmed in his chap. 30, of the same book; by Ruysch Obs. 34, 35, 36; by Dr. Rutty, in Philos. Trans. numb. 336; p. 98, by Mr. Warner, in his cases in surgery. Monro on the dropsy, p. 215; Mis. cur. a. n. c. dec. 2. ann. 2. obs. 158; ibid. dec. 1. ann. 1. obs. 152. hist. 2; Gooch's cases in surgery, p. 39; Bonet. Sepulchr. anat. lib. 1. sect. 16, Additament. obs. 4; Haller's Cases, case 14, exp. 5; Platneri Instit. Chirurg. Rat. sect. 747.

THE

THE tumour was however afterwards opened by a ſurgeon and the child died in a few days. Soon after this another child was brought to me with a tumour of the ſame kind, upon the occiput; I gave the parents the ſame advice I had done to the other, but they likewiſe applied to another ſurgeon, who took off the tumour, and the child died the next day.

I HAVE ſeen many caſes of tumours of this ſort on various parts of the ſpine, os ſacrum, and occiput, ſome of which have been unwarily opened, and the event has always proved fatal.

LE DRAN, in his obſervations of ſurgery, obſ. 1, relates the caſe of a tumour upon the head of a new born child, covering almoſt the whole right parietal bone, which had all the appearance of a hernia of the brain, and was perfectly cured by compreſſion.

REMARK.

Remark.

My intention in relating theſe caſes, is to ſhew that the tumours which children bring into the world with them, are ſome of them curable by extirpation, without any danger; and that the ſooner this is done the leſs will be the deformity; but that every attempt to extirpate others ſhould always be carefully avoided, as certain death either immediately or in a few days muſt be the conſequence.

Hare lips, imperforated noſtrils, adheſions of the fingers, and of the toes, are beſt remedied ſoon after birth, as I have often experienced.

Vari

Vari & Valgi.

IT ſeems very clear to me, that thoſe deformities in the feet of new born children, commonly called club-feet, are not owing to any original mal-formation of the parts, but only to the too long continuance of the unborn infant in ſuch a ſituation in the womb, as permitted a conſtant preſſure from it upon the ſides of the feet. If the foot is in this manner turned inwards, the internal malleolus is cramped in it's growth, by the conſtant preſſure of the aſtragulus, and for want of a proper preſſure of the os calcis upon the loweſt proceſs of the fibula, this bone grows more luxuriant. The whole muſcle called tibialis poſticus becomes a little ſhorter, the peronœus poſticus a little longer than what is natural, and ſo over ſtretched as to be unable to counterbalance it's antagoniſt. This deformity is called *varus*, and is much more common than the *valgus*, where the foot is turned outwards, as may eaſily be conceived from the uſual poſture of a child in the womb. It is evident

that this laſt, muſt, in every reſpect, be intirely the reverſe of the former.

WHAT confirms me in the opinion that theſe deformities are not the effects of any original faults of formation, is the certain and perfect cure that may be obtained, if the parts are put in a right poſition immediately after birth, and properly retained in it. Mr. Cheſelden, in his appendix to Gataker's tranſlation of Le Dran, and in his anatomy, recommends a bandage made of ſeveral ſlips of linen dipped in a mixture of white of eggs and flour, holding the limb in a proper poſture till the bandage is grown ſtiff; but this method alone will, I believe, ſcarcely prove ſufficient. After ſecuring the parts in this manner, or by ſlips of ſticking plaſter, artfully applied, I uſe a machine, made of tin, lined with leather, well adapted to the leg and foot, and tied on by ſoft leather thongs. This machine I invented many years ago, and have always found it effectual, frequently without any bandage. The longer after

birth the cure is delayed, the greater are the difficulties.

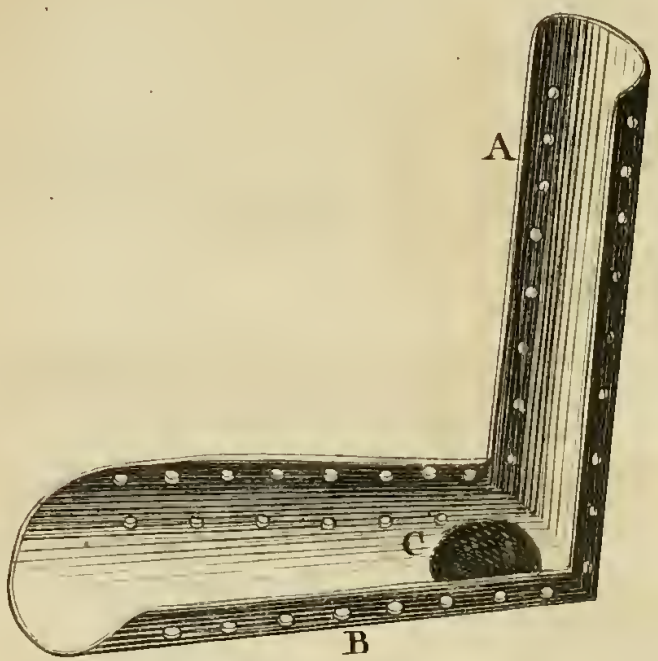
For further information on this ſubject, Hildanus, Parey, Heiſter, and Cheſelden may be conſulted.

P. S. Juſt as theſe ſheets were going to the preſs, I was informed that Dr. Hunter had, in his lectures, expreſſed himſelf much to the ſame purpoſe that I have done, in regard to the cauſe of this deformity. It gives me no little pleaſure to find that my opinion correſponds with that of ſo able a man.

PLATE V.

Two different views of the machine for diſtorted feet.

A A The part for the leg.
B B The part for the foot.
C C The hole for the heel.


A
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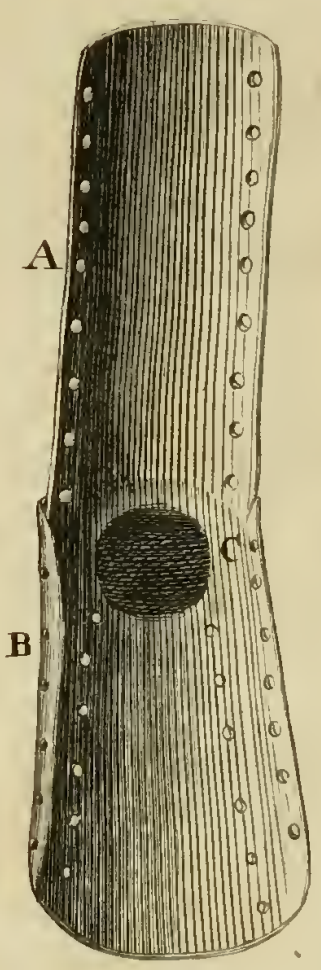
A
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B

An Account of the ſucceſsful Treatment of a locked Jaw, and other ſpaſmodic Symptoms, ſuppoſed to have been occaſioned by a Wound in the fourth Finger of the left Hand. Publiſhed in the Med. Obſervations, Vol. ii. p. 382.

ON September 3, 1759, I was called to Samuel Wood, aged twenty, an apprentice to a diſtiller in Mancheſter, who had been ſeized four days before with a ſpaſmodic contraction of his lower jaw, and a pain in his throat, and theſe ſymptoms were then increaſing very faſt.

I FOUND his jaw ſo cloſely locked as to render it impoſſible to have it opened without running the greateſt riſk of breaking it. He was obliged to be nouriſhed by liquid diet only, which was poured between his teeth. Violent convulſive ſpaſms ſeized him almoſt every minute; and his head was thrown back with ſuch violence whenever he attempted to riſe

from his chair, that he was frequently daſhed againſt the ground. His legs were affected with the ſame ſpaſmodic ſymptoms. His eye-lids were much contracted; and his hearing greatly impaired. It was with difficulty that he parted with his water; and he had no ſtools but what were procured by glyſters. His neck and ſpine were rigid. He had the convulſion of the mouth, commonly called the *riſus cynicus*. The *gaſtrocnemii* and *abdominal* muſcles were as tenſe as poſſible, and all his joints ſo ſtiff, as not to be moved without great violence.

I ENQUIRED whether he had received any hurt upon his fingers or toes, and was anſwered in the negative, but upon taking hold of his left hand, I diſcovered a little plaſter upon the anterior part of his fourth finger. His friends informed me that the cauſe of this application was, indeed, a bruiſe which he had received, by a caſk falling upon it about a month before, but the wound was very trifling; and that by

the

the aſſiſtance of a gentleman in the neighbourhood, a ſurgeon and apothecary, it was ſo near well, that he had not the leaſt inconvenience from it.

Upon removing the plaſter, the finger appeared free from any inflammation or ſwelling, but had a little diſcharge of thin limpid matter, from an orifice ſo ſmall, that it would but juſt admit the point of a very ſlender probe, upon the introduction of which I plainly perceived that the bones of the ſecond and third phalanx were bare in the joint; and upon endeavouring to move the finger different ways, was ſatisfied that the ligaments were deſtroyed, and the uſe of the joint intirely loſt.

Though I was myſelf convinced, I could not, by any arguments, perſuade either him or his friends, that his diſorder was owing to this accident. He had continued well for three weeks, and had not the leaſt return of pain in his finger, ſince the time the caſk had fallen upon it.

I BLED him, ordered a large bliſtering plaſter to be applied to his back, gave him a vomit, and a purging draught, without any good effect, and adminiſtered glyſters with very little better ſucceſs. He took muſk, bark, camphire, and valerian in large quantities, but to no purpoſe: Opiates alone ſeemed to mitigate his ſymptoms. I began by giving them in ſmall doſes, but increaſed them gradually, till he took a grain of opium every hour; and this he continued doing for ſeveral days together, without getting by that means more ſleep than uſual. But theſe opiates procured only temporary relief, and when they were omitted, he relapſed into as bad a ſtate as ever. I now repreſented to his friends that the taking off the end of his finger was the only method to preſerve his life, which I apprehended to be in the moſt imminent danger. They at length conſented, and I took off the laſt phalanx at the articulation, ſix weeks after the accident happened. His diſorder nevertheleſs did not abate. This I ſuppoſed to be occaſioned by ſome ſmall ſplinter at the end

of

of the ſtump, irritating the nervous ſyſtem; and accordingly four or five days afterwards, as ſoon as the ſkin and tendons had contracted, and receded a little from the bone, I nipped off it's extremity with a pair of cutting pincers. His convulſive ſpaſms were immediately both leſs ſevere and leſs frequent. I reduced the quantity of opiates by degrees, till, in about a month, his fits intirely left him. His jaw however remained ſo ſtiff, that he could but open it a little way; and the muſcles of his belly and legs were ſo tenſe, that he could not walk without aſſiſtance. But theſe ſymptoms were ſoon removed by the uſe of the warm bath * frequently repeated. He has ever ſince remained perfectly well, is now healthy and ſtrong, and able to undergo any kind of fatigue, his conſtitution not being in the leaſt impaired either by the

* SINCE the publication of this caſe in the Medical Obſervations and Inquiries, I have found the warm bath of great ſervice in the cure of the locked jaw, when opiates and many other remedies had failed. See *An Account of the topical Application of the Sponge*, p. 31.

opiates * he had taken, or by the violence of ſo terrible and ſo continued a diſorder.

As this malady had been ſo generally reputed mortal, I muſt acknowledge that it was the recital of the two caſes in the Medical Obſervations and Inquiries, by a Society of Phyſicians in London, which directed me to purſue this method. This ſhews the great advantage reſulting from the publication even of ſingle caſes, and will therefore, I hope, make any apology unneceſſary for the trouble I have now given you. In the ſpace of twenty years ſeveral caſes of the ſame kind have happened in this town and neighbourhood, all of which proved mortal; but as none of them fell under my care, I can give no particular account of them.

* He took in about five weeks three hundred and ſeventeen grains of opium, beſides ſeveral draughts, containing in them liquid laudanum, and ſyrup of poppies.

An Account of a Caſe in which the upper Head of the Os Humeri was ſawn off, a large Portion of the Bone afterwards exfoliated, and yet the intire Motion of the Limb was preſerved. Read before the Royal Society, Feb. 9, 1769.

EDMUND POLLIT, of Sterling, near Cockey-Moor, in this county, aged fourteen, of a ſcrophulous habit of body, was admitted into the Mancheſter Infirmary, April 6, 1768. The account I received with him was, that he had been ſuddenly ſeized, about a fortnight before, with a violent inflammation in his left ſhoulder, which threatened a mortification, but at laſt terminated in a large abſceſs, which was opened with a lancet a few days before his admiſſion. The orifice was ſituated near the axilla, upon the lower edge of the pectoralis major, and through it I could diſtinctly feel the head of the os humeri, totally diveſted of it's burſal ligament. The matter, which was very offenſive, and in great quantity, had made it's way down to the middle of the humerus, and had likewiſe

burſt

burſt out at another orifice, juſt below the proceſſus acromion, through which the head of the os humeri might eaſily be ſeen. The whole arm and hand were ſwelled to twice their natural ſize, and were intirely uſeleſs to him. He ſuffered much pain, and the abſorption of the matter had brought on hectic ſymptoms, ſuch as night ſweats, diarrhœa, quick pulſe, and loſs of appetite, which had extremely emaciated him.

In theſe very dangerous circumſtances there ſeemed to be no reſource but from an operation. The common one in theſe caſes, that of taking off the arm at the articulation, with the ſcapula, appeared dreadful, both in the firſt inſtant, and in it's conſequences. I therefore propoſed the following operation, from which I expected many advantages, and performed it on the fourteenth of the ſame month. I began my inciſion at that orifice which was ſituated juſt below the proceſſus acromion, and carried it down to the middle of the humerus, by which all the ſubja-

cent

cent bone was brought into view. I then took hold of the patient's elbow, and eaſily forced the upper head of the humerus out of it's ſocket, and brought it ſo intirely out of the wound, that I readily graſped the whole head in my left hand, and held it there till I had ſawn it off, (vid. fig. I.) with a common amputation ſaw, having firſt applied a paſteboard card betwixt the bone and the ſkin. I had taken the precaution of placing an aſſiſtant, on whom I could depend, with a compreſs juſt above the clavicle, to ſtop the circulation in the artery, if I ſhould have the misfortune to cut or lacerate it, but no accident of any kind happened, and the patient did not loſe more than two ounces of blood, only a ſmall artery which partly ſurrounds the joint being wounded, which was eaſily ſecured.

He was remarkably eaſy after the operation, and reſted well that night; the diſcharge diminiſhed every day, the ſwelling gradually abated, his appetite returned, and all his hectic ſymptoms vaniſhed. In about

five or six weeks I perceived the part from which the bone had been taken, had acquired a considerable degree of firmness, and he was able to lift a pretty large weight in his hand. At the end of two months I found that a large piece of the whole substance of the bone that had been denuded by the matter, and afterwards exposed to the air, was now ready to separate from the sound, and with a pair of forceps I easily removed it, (vid. fig. II.) After this exfoliation the wound healed very fast, and on August 15, he was discharged perfectly cured. On comparing this arm with the other, it is not quite an inch shorter; he has the perfect use of it, and cannot only elevate his arm to any height, but can likewise perform the rotatory motion as well as ever. The figure of the arm is no ways altered, and from the use he has of it, and it's appearance to the eye and to the touch, I think I may safely say the head, neck, and part of the body of the os humeri are actually regenerated.

I DID not make uſe of any ſplints, machine, or bandage during the cure, to confine the limb ſtrictly in one certain ſituation, nor was his arm ever dreſſed in bed, but ſitting in a chair, and as ſoon as he could bear it, ſtanding up with his body leaning forwards, to give room for the application of the bandages, which were no more than what was juſt neceſſary to retain the dreſſings; and to this method I attribute the preſervation of the motion of the joint, which could not have been ſo well effected any other way, as the joint would in all probability have remained ſtiff, and formed an anchyloſis, if it had not been allowed to play about.

REMARKS.

THOUGH from this operation I hoped for many advantages preferable to the amputation of the limb at the ſcapula, yet my moſt ſanguine expectations fell greatly ſhort of the ſucceſs attending it. I did not flatter myſelf with the hopes of a moveable joint, or that the length of the limb

limb would be ſo nearly preſerved, where there was a loſs of above four inches of the whole ſubſtance of the bone, without any other bone to ſupport it, as in the leg and fore-arm, and where the dreadful condition of the arm, at the time of the operation, prevented me from making uſe of any machine to keep it extended *. But I ſuppoſe the weight of the arm was in this caſe in ſome meaſure ſufficient to counterbalance the contractile power of the muſcles, as his arm was only ſuſpended by a common ſling, and the patient not at all confined to his bed. I could not help being ſurprized to find ſo much ſtrength and firmneſs, as evidently ſhewed a regeneration of the bone, before the lower part had exfoliated, or even before it had begun to looſen. The oſſeous matter could not proceed from the ſcapula, the glenoid

* AFTER the extraction of three inches and ten lines of the os humeri, Mr. Le Cat made uſe of a machine to keep the upper and lower pieces of the bone at their proper diſtances. He has given a deſcription of the caſe, and a figure of the machine in vol. 56 of the Philoſ. Tranſ. p. 270.

cavity

cavity of that bone not being diveſted of it's cartilage, could it then poſſibly eſcape from the end of the ſound bone, before the morbid part had begun to ſeparate from it? Or are there any veſſels that could convey the boney matter, and depoſit it in the place of what had been removed *.

* Mr. Gooch, in his volume of caſes and practical remarks, relating the caſe of a compound fracture of the leg, where a very conſiderable portion of the tibia was ſawn off, ſays, "In about three weeks "I was ſenſible, as were alſo ſeveral ſurgeons, whom "curioſity led to ſee ſo uncommon a caſe, that the "ſubſtance which grew in the ſpace of five inches "intirely void of bone, had acquired in the middle "only a greater degree of ſolidity than fleſh, which "circumſtance not agreeing with the generally received "notion of the generation of callus, we proved, be-"yond diſpute, with a ſharp pointed inſtrument; and "we obſerved that the oſſification was gradually "formed from that central point, which was conſi-"derably advanced before any exfoliation was caſt off "the ends of the divided bone. In leſs than four "months the whole ſpace was ſo well ſupplied with "the callus, or rather new bone, that he was able "to raiſe his leg, when the bandage was off, without "it's bending."

Caſes and Remarks, new edit. p. 287.

THESE are points that I will not pretend to decide abſolutely, but I am much inclined to the latter opinion *. Is it not probable that there was a regeneration of the cartilage as well as of the bone? It is well known to every body converſant in anatomy, that not only the ends of ſome bones which are joined to no others are covered with cartilages, but that they are never wanting on the ends, and in the jointed cavities of ſuch bones as are deſigned for motion, and I cannot ſee in this caſe how the motion could be preſerved ſo complete without a cartilage;

* "IN univerſum in ſanguine materies eſt apta "producendo oſſi, quæ adeo frequenter in celluloſum, "ſpatium intimum, interque convexam ſuperficiem "membranæ intimæ muſculoſæ extremitatem, effun- "ditur, & caſeoſa primo, inde calloſa quaſi coriacea, "demum oſſeæ ſquamæ fit ſimillima."

Halleri Elem. Phyſiol. tom. 8. p. 316.

"CALLI in oſſibus non fracturas ſolas, ſed omiſſa "integra oſſa ſarcientes, fiunt ex liquido glutinoſo, "pulſu proximarum arteriarum compacto," &c.

Halleri primæ lineæ, p. 148.

SEE further, Haller's Pathological Obſervations, obſ. 47.

and indeed without a burſal ligament, or ſomething analogous to it, to contain the ſynovia, and keep the bone in it's place.

As this is the firſt operation of the kind that has been performed, or at leaſt made public, I thought the relation of it might poſſibly conduce to the improvement of the art. That ingenious ſurgeon, Mr. Gooch, has indeed related three inſtances of the heads of bones being ſawn off in compound luxations. In one of theſe caſes the lower heads of the tibia and fibula were ſawn off, and in another that of the radius, and in the third that of the ſecond bone of the thumb, but theſe were in many reſpects different from the preſent caſe. I believe it will ſeldom happen that this operation will not be greatly preferable to the amputation of the arm at the ſcapula, as this laſt is generally performed for a caries of the upper head of the os humeri, and as the preſervation of a limb is always of the utmoſt conſequence, and what every ſurgeon of the leaſt humanity would at all times wiſh for, but particularly

where, as in this caſe, the whole limb, and it's actions, are preſerved intire, the cure no ways protracted, and the danger of the operation moſt undoubtedly leſs. For though amputation is often indiſpenſably neceſſary, and frequently attended with little danger or inconvenience when only part of a limb is removed, yet where the whole is loſt, the danger is greatly increaſed, and the loſs irreparable.

I HAD frequently performed this operation upon dead ſubjects, and where the parts had not been diſeaſed, and never found any difficulty; and from a diſſection of the parts had no reaſon to doubt of ſucceſs in a living ſubject, where the ligaments and muſcles are more ſupple, and the matter, by inſinuating itſelf betwixt the bone and integuments, has made leſs diſſection neceſſary. I have likewiſe, in a dead ſubject, made an inciſion on the external ſide of the hip joint, and continued it down below the great trochanter, when, cutting through the burſal ligament, and bringing the knee inwards, the upper

head of the os femoris hath been forced out of it's ſocket, and eaſily ſawn off; and I have no doubt but this operation might be performed upon a living ſubject with great proſpect of ſucceſs.

THE Royal Academy of Surgery at Paris, propoſed for a prize queſtion, whether amputation of the thigh, at it's articulation with the os innominatum, was ever adviſeable; but, was I under a neceſſity of performing this operation, or that which I have been deſcribing, I ſhould not heſitate a moment which to prefer.

I HAD the honour of ſhewing to the Royal Society the bones which were taken from the boy's arm, at the time this paper was read, and they are now depoſited in their muſeum.

Fig. 1.

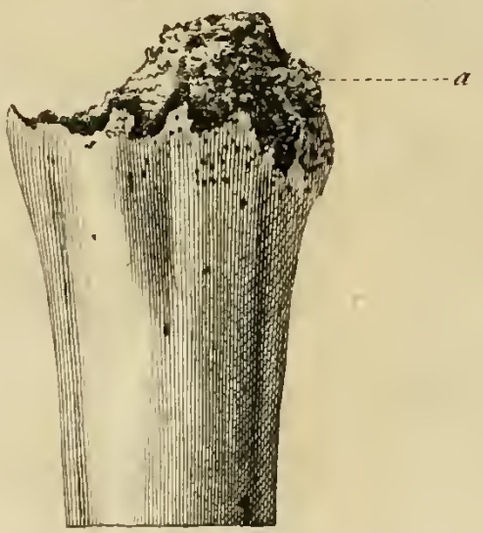


Fig. 2.

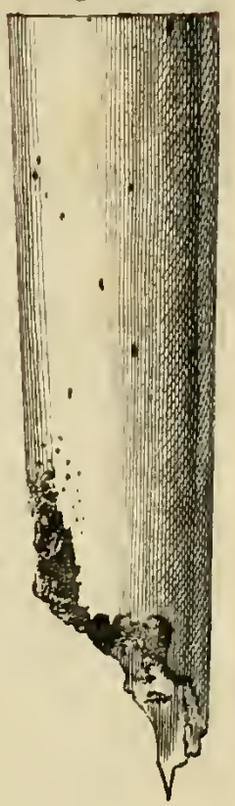
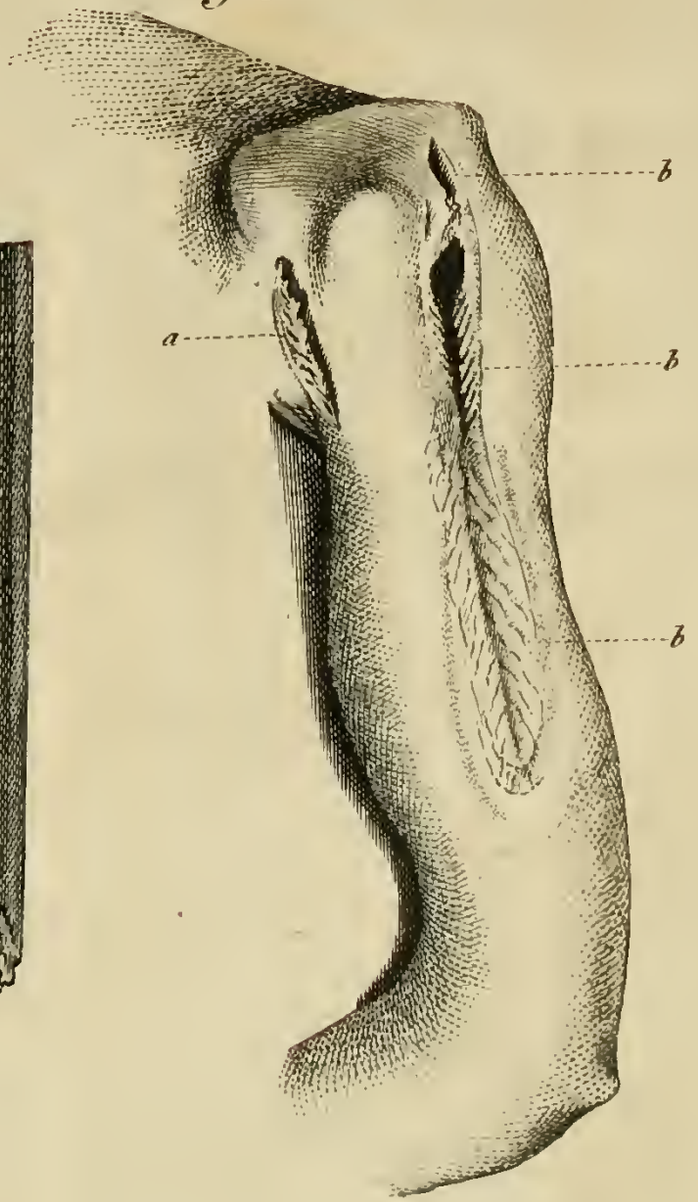


Fig. 3.



J. Mynde sculp.

An Account of a remarkable Operation on a broken Arm, communicated to the Royal Society, and inſerted in their Philoſophical Tranſactions for the Year 1760.

ROBERT ELLIOT, of Eyham, in Derbyſhire, a very healthful boy of nine years old, had the misfortune, about Midſummer, in the year 1759, by a fall, to fracture the humerus, near the middle of the bone. He was immediately taken to a bone-ſetter in that neighbourhood, who applied a bandage and ſplints to his arm, and treated him as properly as I ſuppoſe he was capable of for two or three months. His endeavours, however, were by no means productive of the deſired effect, the bones not being at all united. A ſurgeon of eminence, in Bakewell, was afterwards called in; but as he ſoon found he could be of no ſervice to him, and as the caſe was very curious, he adviſed the lad's friends to ſend him to the Infirmary at Mancheſter. He was accordingly brought thither the Chriſtmas following, and admitted an in-patient. Upon examination

we found it to be a ſimple oblique fracture, and that the ends of the bone rode over each other: his arm was become not only intirely uſeleſs, but even a burthen to him, and not likely to be otherwiſe, as there was little probability that it could ever unite, it being now ſix months ſince the accident happened.

AMPUTATION was therefore propoſed as the only method of relief; but I could not give my conſent to it, for as the boy was young, and had a good conſtitution, it was hardly poſſible that it could be owing to any fault in the ſolids or fluids, but that either nature was diſappointed in her work by frequent friction, while the callus was forming, or rather, that the oblique ends of the bone, being ſharp, had divided a part of a muſcle, and ſome portion of it had probably inſinuated itſelf betwixt the two ends of the bone, preventing their union. Which ever of theſe might be the caſe, I was of opinion, that he might be relieved by the following operation, viz. by making a longitudinal inciſion

ciſion down to the bone, by bringing out one of the ends of it, which might be done with great eaſe as the arm was flexible, and cutting it off, either by the ſaw or cutting-pincers, then by bringing out the other, and cutting off that likewiſe, and afterwards by replacing them end to end, and treating the whole as a compound fracture.

THE objections made by the other gentlemen concerned, to this propoſal, were, Firſt, The danger of wounding the humeral artery by the knife. Secondly, The laceration of the artery by bringing out the ends of the bones. And Thirdly, That we had no authority for ſuch an operation. As to the firſt, that was eaſily obviated, by making the inciſion on the ſide of the arm, oppoſite to the humeral artery. The place of election appeared to to me to be at the external and lower edge of the deltoid muſcle, as the fracture was very near to the inſertion of that muſcle into the humerus; the danger of wounding the veſſel not only being by that means

avoided, but, after the operation, while the patient was confined to his bed, the matter would be prevented from lodging, and the wound be eaſily come at, to renew the dreſſings. The ſecond objection will not appear to be very great, when we conſider that in compound fractures the bone is frequently thruſt with great violence through the integuments, and ſeldom attended with laceration of any conſiderable artery; and as this would be done with great caution, that danger would appear very trifling. The third and laſt objection is no more than a general one to all improvements.

THIS method which I have been propoſing, was at laſt reſolved upon, and I aſſiſted in the operation, which was performed, by a gentleman of great abilities in his profeſſion, on January 3, in the preſent year. The patient did not loſe above a ſpoonful of blood in the operation, though the tourniquet was not made uſe of. When the operation and dreſſings were finiſhed, the limb was placed in a fracture-

box,

box, contrived on purpoſe, the lad confined to his bed, and the reſt of the treatment was nothing different from that of a compound fracture.

The wound was nearly healed in a fortnight's time, when an eriſipelas came on, and ſpread itſelf all over the arm, attended with ſome degree of ſwelling; this by fomentations, and the antiphlogiſtic method, ſoon went off, and the cure proceeded happily, without any other interruption. In about ſix weeks after the operation the callus began to form, and is now quite firm. The arm is as long as the other, but ſomewhat ſmaller, in conſequence of ſuch long continued bandages; he daily acquires ſtrength in it, and will ſoon be fit to be diſcharged.

A fractured Thigh, attended with uncommon Circumſtances.

JOSEPH GODWIN, a farmer, at Thorncliffe, near Leek, in Staffordſhire, betwixt forty and fifty years of age, on June 6, 1768, had the misfortune to fracture his thigh-bone about the middle. Mr. Cope, a very ingenious ſurgeon at Leek, was immediately ſent for, who treated it with greateſt propriety: but about ſix weeks after the accident it was diſcovered not to be at all grown. It was again ſecured with a bandage and ſplints, and the patient ſtill ordered to be confined, but with no better ſucceſs, for, at the expiration of ſix months, it was in the ſame ſituation.

I WAS then conſulted, and informed that the patient was quite tired out, and very deſirous of having the limb taken off, if no other method could be thought of to make the bone unite. I adviſed a caſe to be made of ſtrong leather, jacked ſo as to be very ſtiff, commonly called Ben-

leather

leather, of ſuch a length that the upper end ſhould reſt againſt the pubis, iſchium, and ilium, and the lower on the inferior apophyſis of the thigh-bone, by which, when it was laced on, the thigh might be kept extended. I alſo recommended it to the patient to get out of bed, and by the help of this caſe and crutches to endeavour to walk. He began this method on November 10. At the end of December, near ſeven months after the accident happened, it could not be ſaid that the bone was at all grown, but ſoon after that time the callus began to form, and was perfected by the beginning of February. After he had worn this caſe ſome time, his thigh began to ſwell, and at laſt a large abſceſs appeared, which was opened by Mr. Cope, on February 21, and contained two or three quarts of matter. On introducing my fingers into the wound, I diſtinctly felt the two ends of the bone, which were broken tranverſely, riding over each other, but perfectly united. The patient was brought very low by the diſcharge, but by the uſe of the bark, and light

light nouriſhing diet, he recovered in a few weeks, and is now able to walk many miles in a day, without the leaſt aſſiſtance.

Remarks.

The non-formation of the callus at firſt, in this caſe, as well as in the preceding one, I imagine is to be attributed to ſome intervening ſubſtance, which had prevented the divided parts of the bone from coming into contact: for, it is a fact well known, that a callus will form whether the fracture be tranſverſe or oblique, if only the ſides of a bone be brought together, though the ends of it do not ſo much as touch each other.

I have ſome bones in my poſſeſſion, particularly a thigh-bone, which prove this. There are likewiſe ſeveral inſtances of bones uniting, when no part has come into contact, but the callus has ſhot ſeveral inches, and I believe this will generally happen if there be nothing to obſtruct it.

In

In the preſent caſe I apprehend that the leather thigh-caſe being laced on tolerably tight, preſſed the ſides of the bone againſt the intervening ſubſtance, which, together with the friction ariſing from his attempts to walk, brought on inflammation and ſuppuration, which deſtroyed it, and thereby gave the callus room to ſhoot. I am the more inclined to believe this happened, as there was no ſign of an abſceſs, or ſwelling at the time he began to wear the caſe, and when the abſceſs was opened, the bone lay bare for a conſiderable length, covered only by it's perioſteum.

An Account of an Operation ſucceſsfully performed upon a broken Leg, in which the fractured Tibia was not united, though thirty-ſix Weeks had elapſed after the Accident.

JAMES PICKUP, a very healthy, active man, aged twenty-three years, broke his leg by a fall on February 18, 1769. A bone-ſetter, near Rochdale, was immediately ſent for, under whoſe management he remained till October 9, following, upwards of thirty-three weeks, when he was admitted an in-patient of the Manchester Infirmary, and fell under my care. Upon examining the leg very attentively, I found than it was an inch ſhorter than the other, and that there had been a * ſimple oblique fracture of both the bones, about four inches above the ancle joint.

* SOME authors have divided fractures into ſimple, compound, and complicated, but I uſe the term ſimple in the ſenſe in which the Engliſh have always uſed it, viz. whether one or more bones be broken, provided it is not complicated with a wound.

The

The broken parts of the fibula were united, but thoſe of the tibia were ſo far from being in the ſame condition, that they were perfectly looſe, and moveable. The fractured ends of the tibia, as well as of the fibula, rode over each other, and ſeemed never to have been properly coaptated. The leg was intirely uſeleſs, and my patient was not able to move about without crutches.

I THOUGHT it extremely probable that an operation ſomewhat ſimilar to that which was performed upon Robert Elliott, would be attended with the like ſucceſs. But as there was no neceſſity for it's being performed immediately, and, as in ſome circumſtances, Pickup's caſe was different from that of Elliott, for the preſent, that I might have time to make proper obſervations, and lay down a ſuitable plan for my future conduct, I only applied freſh bandages, and confined him to his bed. Elliott's fracture was of the humerus, and that bone being ſupported by no other, his arm was perfectly flexible; conſequently the

ends were eaſily turned out of the inciſion, and cut off with eaſe. But in this caſe there were two bones, the fracture of the fibula was united, and I was prevented from bringing out the broken ends of the tibia. Some variation was therefore neceſſary to be made in my mode of operation.

My patient was willing to undergo any thing that might conduce to the recovery of his limb; and, upon the firſt of November, I proceeded in the following manner:

I made a longitudinal inciſion, about four inches in length, through the integuments which covered the fracture. This diſcovered to me the ſuperior extremity of the broken bone, a little pointed, covered over with a ſubſtance perfectly ſmooth, and in every reſpect reſembling the extremity of a bone tipped with a cartilage. No ſign of a callus appeared. By the application of a very large crown

of a trephine, I eaſily cut off the end. This brought the * inferior part of the fractured bone more into view, and it appeared to be no eaſy matter to cut off the end of it, without putting my patient to much pain, and probably expoſing his life to ſome danger; but as I did not doubt that every impediment to the formation of a callus might now be removed without it, I contented myſelf with ſcraping off the perioſteum from the inferior part of the bone, and ordered him to be put to bed, after I had filled the wound with dry lint, and had applied the common dreſſings and banda-

* My good friend Mr. Pott, who has, in all his treatiſes, written with ſo much preciſion, clearneſs, and perſpicuity; in his general remarks on fractures, and diſlocations; has obſerved, in p. 59, that "If "the tibia and fibula be both broken, they are both "generally diſplaced in ſuch a manner, that the in-"ferior extremity, or that connected with the foot, "is drawn under that part of the bone connected "with the knee;" which obſervation was verified in this caſe.

ges *, his knee being a little bent, and his leg and foot lying on their outſide.

He reſted tolerably well. The inflammation and ſwelling which ſucceeded were ſo trifling as not to merit notice. I kept the wound well dilated, ſometimes with ſponge, and ſometimes with dry lint. About a week after the former operation I took off, with the cutting-pincers, a ſmall angle of the bone which had been left by the trephine, and touched the inferior part of the bone with butter of antimony. This I alſo introduced between the fractured extremities, in order to deſtroy a ſubſtance which prevented

* This method of treating fractures is more fully deſcribed by Mr. William Sharp, in vol. 57 of the Philoſ. Tranſ. part 2, 1767; by Mr. Pott, in his treatiſe on fractures and diſlocations; and by Mr. Wathen, in his treatiſe intitled the Conductor, and containing ſplints. The firſt mentioned gentleman did me the honour, ſometime ago, to ſend me ſome of his ſplints, which I have made uſe of with great advantage to my patients. This poſition of the limb is what my father conſtantly uſed in fractures of the thigh for forty or fifty years paſt.

their being brought into immediate contact. I repeated this application three or four times, at proper intervals. A trifling exfoliation enſued. My patient began to mend, and his recovery had no interruption. In about nine weeks after the operation he walked with only the aſſiſtance of a ſtick, in twelve weeks the wound was perfectly healed, and the bone firmly united, and he was diſcharged from the Infirmary January 22, 1770. To the recital of this caſe I muſt beg leave to add the remarks which follow: Caſes of fractured bones which refuſe to be united, though unattended with wounds of the integuments, and where the patients are both young and healthful, are more common perhaps than is generally imagined. Beſides the three I have already related I have ſeen four others of a ſimilar nature; two of them of the humerus, one of the fore-arm, and the other of the leg. In theſe the fractures were of many, one of them more than twenty, years duration, and the bones had never been in union.

THE Baron Van Swieten, in his Commentaries upon Boerhaave's aphoriſms, ſect. 346, tells us, "he had himſelf ſeen a "woman who, having broken her arm, "had it reduced according to art, but that "it never united, though ſhe was in the "flower of her age, continuing flexible "in the broken part during the remainder "of her life, without any great incon-"venience to her."

RUYSCH, in his adverſ. anatom. decad. 2, numb. 2, p. 6, ſays, "he has met with "a caſe where the bones would not unite, "even though all the proper rules of art "were obſerved towards obtaining a cure." And, in his Obſervations anatomical and chirurgical, obſ. 4, p. 8, he relates "that "in the body of a man who was hanged "in full health, he found two of the an-"terior bones of the carpus not yet con-"joined, even though they were fractured "three years before."

TURNER, in his treatiſe intitled the Art of Surgery, vol. 2, p. 153, gives us

the following hiſtory: " A gentleman's " coachman, then of St. Helen's pariſh, " within Biſhopſgate, by a kick from one " of the horſes, had the humerus broke " off in the middle, betwixt the cubit " and the top, articulating with the ſcapula, " upon which, after the reduction, I con- " tinued him in his bed, and, at ten days " end, finding all things appear well for " the time, dreſſed up again, with a mild " cerate, inſtead of the defenſative I had " applied at the firſt dreſſing, ſtill per- " ſuading him to keep his bed, yet grant- " ing a larger liberty in his diet: but at " three weeks end, whether from any " error therein committed, or getting cold " in his riſing, although I rather think " it was an effect of his ill habit of body, " or ſcorbutic dyſcraſy of the juices of his " blood, he fell into a flux of the belly, " which, notwithſtanding all endeavours " by an *elect. ex conſ. roſar. confect.* " *fracaſt. pulv. rhei. torrefact. coral. p. p.* " with a *decoct. c. c. c.* for his drink, " and other methods preſcribed by his " phyſician, ſo prevented our endeavours

to

" to unite and confirm the callus, that at
" ſix weeks end, a ſufficient term for con-
" ſolidating the largeſt bone in a human
" body, when we thought all ſafe, one
" evening, when he was helped off with
" the waiſtcoat ſleeve on that ſide, it
" ſeemed to him that his arm was falling
" to pieces: however, being ſtill kept
" tight and cloſe by the ſplints and bandage,
" he went to bed; and the next morning,
" throwing his cloaths over his ſhoulders,
" in great ſurprize came to my houſe,
" where I had no ſooner looſened the dreſ-
" ſings but I found plainly the callus was
" intirely diſſolved, the arm ſwinging back-
" wards and forwards, as if there had
" never been any ſtay or ſtability beſides
" the muſcles. I was indeed as much
" alarmed myſelf, and did all in my power
" to retrieve the poor fellow's misfortune,
" dreſſing it up with a *catagmatic empl.*
" of the *ſtypt. paracelſ. diapalm. ad hern.*
" with ſome of the conglutinating ſpecies
" melted down therewith, directing, at the
" ſame time, the *pulv. oſteocol. cum ſyrup.*
" *de ſymphito* for ſome weeks longer.

" At length finding all to little or no " purpoſe, his maſter, Mr. Prideaux, ſent " him to St. Thomas's, where, after " other ineffectual attempts for his reco- " very, I underſtood that Mr. Rydout, " whoſe patient he was, whipped off the " uſeleſs limb in the interſtice of the " broken extremities without more to do; " and, healing up the ſtump, diſmiſſed " him: his maſter procuring for him a " letter-carrier's place, by which he ſub- " ſiſted ſeveral years till his death." And the enſuing obſervation we have from Du Verney *: " A man, in falling, frac- " tured the fore-arm four fingers breadth " from the wriſt, ſo that both the radius " and ulna were broken tranſverſely, and " totally divided. Surgeons were imme- " diately called to reduce this fracture, " but the man would not allow himſelf " to be touched, and told them he ſhould " be cured without their aſſiſtance and " bandage. He went about his buſineſs

* Page 174, Eng. edit. by Ingham.

" as

" as uſual, and made uſe of his arm and " hand as much as he poſſibly could. " At length by theſe frequent motions " the ends of each cemented ſeparately. " They were bound by membranes, that " were prolongations of the neighbouring " parts," &c.

I COULD produce more inſtances of this ſort, but as they were complicated with wounds of the integuments, they are not directly to the point; therefore do not fall under our notice at this time.

CELSUS appears to me to have ſpoken more intelligibly upon this ſubject than any other author, either ancient or modern. Indeed he is the only perſon who has propoſed any remedy for this terrible misfortune, which, as it is intirely local, can only be removed by manual operation: he ſays, " When the bones happen not to " unite, becauſe they have been often " opened, and often moved, the method " of cure is obvious; for they may unite,

" if

" if the fracture be of long ſtanding. The " limb muſt be extended, to create a freſh " injury; the bones muſt be ſeparated " from one another by the hand, that " their ſurfaces may be roughened by " rubbing againſt each other, and if there " be any fat ſubſtance it may be abraded, " and the whole of it become, as it were, " recent; great care however muſt be taken " not to wound the tendons or muſcles." He is certainly rather too conciſe in his directions; but for this I dare not venture to blame him, ſince it does not appear he had ever either practiſed this method himſelf, or ſeen it performed by others. Indeed we are far from being certain that he ever was a practitioner of the healing arts; his profeſſion being to this day the ſubject of critical inquiry; but his medical performances have been at all times read with attention, and will merit the admiration of the faculty. I know of no improvements made upon the hint which he has given us. The paſſage has, it is true, been repeatedly quoted

quoted. Du Verney, p. 175, * has given his reaſons againſt it, but I cannot find that either the plan which he laid down has been at any time adopted, or any other ſubſtituted in it's room by his ſucceſſors. The unhappy patients have been obliged to ſubmit to the inconveniencies attendant upon the non-union of the fractured bones, or, what has been ſtill worſe, to the amputation of the limbs themſelves.

The junction of Goodwin's thigh was certainly perfected upon the plan laid down by Celſus, I mean by friction; though his mode of operation was not

* "But if from any cauſe whatever the ends of "each bone ſhould be reunited ſeparately, to obviate "this inconvenience, the callus being recent, it is re- "commended that both ends of the fractured bones be "rubbed againſt each other, in order to wear and de- "ſtroy the extremities of the boney fibres, to facilitate "the nutritive juices cementing them together by a "freſh callus; but this operation is only good in the "ſtudy; for however the whole end of the cemented "bone be rubbed, it is uſeleſs, and even dangerous, "for the patient."

exactly

exactly followed. He ſuffered however more than either Elliott or Pickup, and was brought ſo exceedingly low, by the diſcharges he underwent, as to cauſe me ſome uneaſineſs. For theſe reaſons I muſt give the preference to the other two, where it can be complied with. I can, with ſatisfaction, add that after the operations themſelves were over, I never had leſs trouble with patients labouring under the moſt trifling compound fractures. I muſt further aſſert, that as far as can be determined from theſe inſtances, the operations themſelves are attended with as little danger, and as much certainty of ſucceſs, provided the patients are in health, as any of thoſe uſually performed in the principal caſes of ſurgery; but if theſe accidents originally owe their riſe to ſcorbutic or venereal complaints, thoſe complaints muſt be firſt removed by medicines and a proper regimen; and ſhould the patient be a female, and with child, it ſeems adviſeable to defer this proceſs till ſome time after her delivery, as, in that caſe the

fractured

fractured bones may perfectly unite * of themselves.

When these accidents indeed are to be attributed to extreme old age, or a general fragility of the bones, every attempt towards a cure will, I am afraid, be unsuccessful.

* See Hildan. Oper. cent. vi. obs. 68, p. 582. Misc. Curios. decur. 1. a. 1. obs. 25, p. 91.

An Account of a new Method of reducing Shoulders, which have been ſeveral months diſlocated, without the uſe of an Ambe, in caſes where the common Methods have proved ineffectual, publiſhed in the Medical Obſervations and Inquiries. Vol. II. P. 373.

MR. LONGWORTH of Longworth's folly in Mancheſter, aged ſixty, applied to me about the year 1748, to reduce a diſlocation of his right ſhoulder, which had happened two months before, and upon which ſeveral unſucceſsful attempts had been made by a ſurgeon of extenſive practice and great experience, under whoſe care he was put immediately after the accident. Upon examining him I found that the head of the humerus had paſſed beyond the coracoid proceſs, and lay under the pectoral muſcle; a ſituation generally attended with a great deal of trouble.

I ATTEMPTED, but without ſucceſs to reduce it by the means of * pullies and bolſters, keeping the arm at a right angle with the body; and afterwards made ſome ineffectual trials with the heel in the armpit. Both theſe methods are recommended by moſt writers on this † ſubject and are generally ſucceſsful.

MY want of ſucceſs hitherto put me upon conſidering whether the capſular ligament might not have been lacerated, when it was upon it's full ſtretch, the head of the bone paſſed through the laceration, and the ligament itſelf collapſed about it's neck. I apprehended that if this was the caſe, the only method could be, to put the limb into the ſame poſition it was in when the accident happened, and in that poſition to make an extenſion. But

* FORMS of theſe pullies may be ſeen in Scultetus, Vitruvius, Heiſter, and Deſaguliers.

† WISEMAN, Parey, Manget bib. chirurgic. Turner, Heiſter, Petit, and Fabricius ab aqua-pendente.

as my patient was very much in liquor at the time he got his hurt, he was not able to give me the leaſt information about the manner of his receiving it. I was however ſatisfied from the nature of the articulation, from the diſpoſition of the acromion and coracoid proceſſes, and of the ſtrong broad ligament that is ſtretched between them, that the luxation of this joint is ſcarcely poſſible, whenever the arm makes an acute angle with the trunk of the body, ſo that this accident muſt have happened either, when the arm made an obtuſe angle therewith or more probably when it was raiſed ſo high, as to be nearly in an erect poſition. I therefore proceeded in the following method.

HAVING ſcrewed an iron ring into a beam at the top of the room, I fixed one end of my pullies to it, and faſtened the other to the diſlocated arm by ligatures about the wriſt, placing the arm in an erect poſition. In this manner I drew up my patient till his whole body was ſuſpended; but that too great a force might

not be ſuſtained by his wriſt, I directed at the ſame time, two other perſons to ſupport his arm above the elbow. I now attempted to conduct the arm into it's place with my hands, when feeling it give way, and hearing it ſnap, I concluded it muſt have returned into it's ſocket, and ordered him to be taken down as carefully as poſſible.

I FOUND the bone had only ſomewhat changed it's ſituation, the head of it having approached near to the axilla. This however gave me hopes that I was right in my conjectures, that it had paſſed through a laceration of the burſal ligament, and that it was now brought back, and might be reduced by any of the common methods of operation. I accordingly tried the heel in the armpit, and the bone returned to it's place with the greateſt facility. My patient in a few weeks recovered the perfect uſe of his arm, and has not ſince ſuffered from it the leaſt inconvenience.

Case II.

John Roobotham, of Macclesfield in county of Cheſter, a remarkable ſtrong man, of betwixt thirty and forty years of age, had the misfortune in the year 1749 to diſlocate his left ſhoulder. The reduction of it had been attempted by ſeveral ſurgeons in the town, and I was not applied to till three months after the accident happened. The vacuity beneath the proceſſus acromion, the tumour in the axilla, and the diſtance of the elbow from the body, which could not be diminiſhed without occaſioning the greateſt pain, ſatisfied me immediately of the reality of the luxation.

I fastened his arm to the pullies, as in the former caſe, and drew him up till his whole body was raiſed from the ground, when the bone inſtantly ſlipped into it's ſocket. No other violence was uſed than what is here mentioned, the whole of the operation did not take up

more than a minute; and the free uſe of his arm was recovered in a ſhort time after.

Case III.

James Dawson, of Leigh in this county, aged thirty-five, was admitted into our infirmary, September 29, 1760, and put under my care, for a violent blow which he had received a fortnight before upon the anterior and ſuperior part of his ſhoulder, when his arm was raiſed.

It was diſlocated in a very extraordinary manner; he had little or no pain either upon the place upon which he received the blow, or in any part of the joint. The pain, though very great, was confined to about four fingers breadth below the articulation, exactly where the deltoid muſcle is inſerted into the humerus. His arm lay cloſe to his body: the leaſt elevation of it increaſed his pain, and the head of the bone was forced under the ſcapula, of which I was made ſenſible, by

by perceiving it's lower angle to be ſomewhat puſhed outwards.

I TRIED in vain the common methods of reduction, eſpecially that of the heel in the armpit. I had not now the pullies with me, for which reaſon I ordered three or four ſtrong men to ſtand upon a table, and to raiſe the patient up by his diſlocated arm, placing it in an erect poſition, till his whole body ſhould be ſuſpended. As I endeavoured to help the head of the bone into it's ſocket, I perceived it to give way conſiderably; and found, upon letting him down, that though it was not in it's place, it had changed it's ſituation, and was intirely in the axilla. From this I concluded it would now very eaſily be reduced, and upon my firſt repetition of the heel in the armpit, after I had laid him upon the ground, it returned into it's place immediately. His pain inſtantly ceaſed, and in a few days he was perfectly well.

Remarks.

I have reduced, by the ſame method, a few other diſlocations of the humerus, but as there was nothing relative to any of them materially different from ſome of the preceding caſes, it will be unneceſſary to trouble you with the particulars.

In the ſecond caſe the reduction was perfected by this new mode of operation alone, inſtantly, with the greateſt eaſe, and that three months after the diſlocation had happened. And I muſt beg leave to obſerve, that though, in two of the above caſes, the reduction was not intirely finiſhed by this method, yet as it was afterwards accompliſhed by the means which had been before unſucceſsfully tried, I cannot help attributing my ſucceſs to the making the extenſion when the arm was raiſed, and thereby bringing back the head of the humerus through the capſular ligament. And I am the more confirmed in this opinion, as the ſituation of the bone

bone was conſiderably changed by theſe extenſions.

THE laſt is a caſe which very rarely occurs, I never ſaw it before, nor do I remember to have met with it in any author except Heiſter, who tells us, "That the head of the bone may often "be diſlocated under the armpit, ſome-"times forwards, ſometimes backwards, "and even below the ſcapula." I am far from thinking that his meaning is ſufficiently clear, but, in all probability, he alludes to the ſame kind of diſlocation. This reduction was performed in the public Infirmary, not only in the preſence of ſeveral pupils, but of gentlemen eminent for their ſkill in different branches of phyſic, who, I dare ſay, will be willing to ſubſcribe to my opinion, that it was owing to my removal of the head of the humerus from under the ſcapula, by the extenſion of the arm in an erect poſition.

I SHALL only further obſerve, that this method is in reality attended with much leſs pain than many others which are frequently practiſed, notwithſtanding it may ſeem ſevere to perſons unaccuſtomed to operations of this nature. For as no force is uſed about the ſhoulder to make a counter-extenſion, the patient does not ſuffer from thoſe troubleſome excoriations and contuſions which but too commonly attend the other methods. And I am every day more and more convinced, that a much leſs force will be neceſſary than what is generally uſed, not only in caſes ſimilar to thoſe above recited; but in diſlocations of other joints, if a proper regard be paid to the nature of the articulation, and to the poſition of the limb at the time when the accident happened.

A Supplement to the preceding Caſes.

MR. H—. of Bolton, a ſtrong, robuſt, middle-aged man, had the misfortune on June 11, 1762, to diſlocate his ſhoulder in ſuch a manner that the head of of the bone was forced under the pectoral muſcle. The accident happened in the morning, and different methods were made uſe of by three ſurgeons in order to it's reduction. In the evening of the day I was ſent for. I ordered an iron ring to to be made, ſo as to ſcrew into a beam, to which I intended to fix my pullies; but before the ſmith could finiſh his work was deſirous of reducing it, if poſſible, by ſome other method. I accordingly cauſed three or four ſtrong men to ſuſpend the patient by his diſlocated arm, after the manner deſcribed in the preceding caſes, but without effect. The heel in the armpit was afterwards tried with as little ſucceſs.

HAVING inquired particularly into the circumſtances of the accident, and the poſition

poſition of his body at the time he received it, he informed me he had hold of an horſe's head, that the horſe threw it upwards, and from him, ſo that his arm, at the ſame time that it was raiſed, was pulled backwards, and in ſuch a manner, that though his elbow was elevated above his head, the poſition of his arm was not intirely perpendicular. The iron ring being finiſhed, and ſcrewed into the top of the beam, I ordered one end of my pullies to be faſtened to it, and fixed the other to his wriſt. I then directed him to ſit down upon the floor, not directly under the ring, but at three or four feet diſtance, with his back rather turned towards it, ſo that when I ſhould begin to uſe the pullies, his arm would be raiſed to ſomething more than an angle of forty-five degrees, and pulled a little backwards. My intention was to put the arm as nearly as I could into the poſture it was in when the accident happened. In this poſition I made an extenſion. The head of the bone glided with the greateſt facility into it's ſocket, not returning with a ſudden

ſhock,

ſhock, as is generally the caſe. The extenſion was ſo very gentle, that though the patient was not ſo much as ſupported by any perſon, yet he was not in the leaſt moved from the place upon which he ſat, and the whole operation was perfomed in a few ſeconds, with leſs pain than uſually attends the mere handling of a diſlocated ſhoulder.

I WAS confidently of opinion that the reduction would be effected by this method, and yet I own the eaſe with which it was performed agreeably ſurprized me.

I HAD only applied one hand to the cord, and drawn it gently, when I perceived the humerus to give way the moment the arm was raiſed to a proper height. Whether the laceration of the burſal ligament is always the grand obſtacle to reduction, I will not take upon me to determine; but I flatter myſelf this caſe will help to prove what I ſometime ago advanced, that the moſt probable means to effect the reduction

are

are to put the diſlocated limb into the poſition it was in when the accident happened, and in that poſition to make an extenſion. Meſſieurs Mather, Lancaſter, and Dutton, ſurgeons in Bolton, were preſent at the reduction.

NOTE, I have reduced a diſlocated ſhoulder in an adult ſubject without any extenſion, merely by putting the arm into a proper poſition, when it inſtantly ſlipped into it's ſocket, without any other aſſiſtance than that of it's own muſcles.

Appendix to the Papers on Diſlocations of the Humerus.

MR. THOMSON, Mr. Pott, and Mr. Kirkland all agree, that in reducing diſlocations of the ſhoulder the fore-arm ſhould be bent. Mr. Pott ſays, * "the fore-arm ſhould at all times, let the "method of diſlocation be what it may, "be bent, viz. becauſe of the reſiſtance of "the long head of the biceps in an ex-"tended poſture." I have ſo great an opinion of the abilities of the above named gentlemen, that I cannot differ from them in any points of practice without pain, and even without almoſt ſuſpecting my own judgment. The opinion of theſe gentlemen ſeems to be founded upon the caſe of a man who died in the London Hoſpital, which is related by Mr. Thomſon, in the ſecond volume of Medical Obſervations and Inquiries: he ſays, "Upon "diſſecting the parts, the deltoid muſcle

* GENERAL Remarks on fractures and diſlocations, p. 120.

was

" was obſerved to be conſiderably ſtretched
" and tenſe, thereby occaſioning the ap-
" pearance of a curvature of the middle
" of the arm, by the head of the hu-
" merus being removed ſo far from it's
" natural place. The coraco-brachialis was
" a little tenſe, but the broad head of the
" biceps connected with it was relaxed;
" the long and round head of this laſt
" named muſcle ariſing from the neck
" of the ſcapula, near the upper edge
" of it's cavity, and which in a ſound
" ſtate croſſes the joint, and paſſes along
" a groove formed for that purpoſe in the
" head of the humerus, to be joined by
" the other head, made a large curvature,
" and thereby being violently ſtretch-
" ed and diſtorted, occaſioned an inſur-
" mountable flexion of the fore-arm. A
" proof of the impropriety of making
" any manner of extenſion in theſe caſes
" of the fore-arm, which ought to be
" bent as much as poſſible, to relax that
" part of the biceps which might other-
" wiſe have been an hindrance to the re-
" duction." That this tendon of the biceps

ſhould ſometimes be ſtretched and diſtorted is not to be wondered at, owing to the peculiar manner of it's paſſing through the articulation, and being connected with the head of the os humeri, and therefore muſt be carried along with it whenever it is diſplaced, but that it ſhould conſtantly and invariably occaſion that inſurmountable flexion of the fore-arm is by no means a fact, as I have never once met with that circumſtance, either before or after reduction, though conſiderable force had been uſed; but it muſt be obſerved, that that force was not uſed ſuddenly, but increaſed gradually; whenever that happens to be the caſe, which I believe will be but rarely, it would not be adviſeable to extend that muſcle too much as it might increaſe the inflammation; however I cannot ſee how it can poſſibly be an hindrance to reduction, but rather an advantage; for as that tendon of the biceps is fixed to the upper part of the acetabulum, and paſſes through the articulation, to be lodged in the deep foſſa of the os humeri, and is tied down by a tendinous ſheath acroſs the foſſa, any exertion of that tendon muſt help to raiſe the head of the bone into it's place when

when a ſufficient extenſion is made. And if the other head of the biceps, which is fixed to the coracoid proceſs, ſhould be ſtretched at the ſame time, they would bring the upper part of the acetabulum downwards, and forwards, which would alſo facilitate the reduction. But I am apprehenſive that the bending of the fore-arm, at the time we are attempting to reduce the ſhoulder, will occaſion a much greater obſtacle than this imaginary one, by ſtretching the muſcle called anconœus major, vel extenſor cubiti longus, which is fixed above by a ſhort tendon to the inferior impreſſion in the neck of the ſcapula, and to a ſmall part of the inferior coſta of that bone, and is inſerted below into the hinder part of the olecranon. This reſiſtance will alſo be very much increaſed by the extenſion being made with ligatures applied above the elbow, conſequently over the tendon of that muſcle, and if this muſcle is extended, it muſt bring the lower edge of the acetabulum ſcapulæ forward, and I believe every ſurgeon endeavours as much as poſſible to keep it back,

back, in order to give a better opportunity of getting the head of the humerus from under the neck of the ſcapula to the brim of the acetabulum, when it will eaſily ſlip into the glenoid cavity: but this cannot be done with ſo much eaſe unleſs the extenſor cubiti longus be relaxed, by extending the fore-arm. But as all reaſoning and theory are fallacious, or, to uſe Mr. Kirkland's words, "one grain of "matter of fact, to a practical ſurgeon, "is worth a pound of reaſoning," I muſt ſay, that during a practice of upwards of twenty years, I do not recollect ever to have failed in reducing a ſhoulder that was recently diſlocated, but I muſt own that I have met with three * old diſlocations

* My want of ſucceſs in one of theſe caſes I apprehend was owing to no attempts having been made to reduce the diſlocation for ſeveral weeks after the accident, which probably gave an opportunity for adheſions to form ſo ſtrong as no common force could diſunite. In another of theſe caſes my patient would not be perſuaded to have a fair trial made, and laſtly, ſince a paper of mine was publiſhed ſome time ago in the Medical Obſervations and Inquiries, recommend-

tions that have reſiſted every method; however, at the ſame time I muſt add, that in all probability the reductions were impracticable, as they were of long ſtanding, and have not ſince been reduced by any other perſon: and I muſt here declare, that in all thoſe in which I had the happineſs to ſucceed, the arm was ſtretched out at full length, and in many caſes, where great force was not neceſſary, the whole extenſion was made from the wriſt; and when greater force was neceſſary, I divided it as much as poſſible by placing aſſiſtants at different parts of the arm, in order to make the extenſion. I have indeed tried to reduce theſe obſtinate diſlocations of the ſhoulder, with the fore-arm bent, but without ſucceſs.

PETIT, Du Verney, and many others, ſay, "that in diſlocations in general, the

ing a new method of reducing diſlocations of the ſhoulder, I have had numerous applications made, many of them from diſtant places, and conſequently it is not to be wondered that ſome incurable caſes ſhould have offered.

extenſions

" extenſions and counter-extenſions muſt
" be made upon thoſe very bones that
" are disjointed, and not upon thoſe next
" to them; as all the force which is
" applied to the bone below muſt neceſ-
" ſarily be loſt in the articulation which
" is not luxated, and be of little or no
" ſervice to that which is; and this is
" owing to the yielding nature of the
" ligaments of the joints. For inſtance,
" if the luxation of the arm was to be
" reduced, one muſt pull the arm itſelf,
" not the cubitus; thruſt back or with-
" hold the ſhoulder, and not the body;
" becauſe that part of the force would
" be loſt in the articulation of the elbow,
" and in the adheſion of the omoplata."

THOUGH this doctrine may be true with regard to diſlocations in general, and indeed to thoſe of the ſhoulder with regard to the ſcapula, the lower part of which ſhould be ſteadily with-held; yet I believe thoſe who conſider the nature of the articulation of the elbow, will agree with me, that this joint cannot give

way much by any common force when in an extended poſition, as the olecranon is then lodged in the poſterior deep triangular cavity of the os humeri. This poſition gives an opportunity to the aſſiſtants of applying their hands to different parts of the arm in making the extenſion, by which means ligatures ſeldom become neceſſary; but when the force is applied to the lower part of the os humeri only, if ligatures are obliged to be fixed upon that part, they are frequently apt to gall and fret the ſkin very much, and cauſe diſagreeable contuſions and ecchymoſes. If the arm is to be uſed by way of lever, the longer that lever, the greater will be it's power, and if the upper end of the os humeri is to be turned anteriorly or poſteriorly during the time of extenſion, it will be done with greater facility when the arm is ſtretched out at full length, than when it is in a ſtate of flexion. The two following caſes that happened while theſe ſheets were at the preſs will perhaps help to elucidate what I have juſt advanced.

A GENTLEMAN

A GENTLEMAN in years, very fat and bulky, had diſlocated his ſhoulder four days before I ſaw him, and the head of the bone lay in the axilla. The method I took to reduce it was as follows: My patient being ſeated on the floor, I placed a large wooden cylinder well covered with ſeveral folds of napkins under his arms, and applied it in ſuch a manner as not only to ſupport his body againſt the extenſion, but alſo to with-hold the inferior part of the ſcapula. This cylinder was held firm by four aſſiſtants, two at each end. Then ſtanding before him, I put his arm through a napkin with the ends tied together, and between my thighs; and putting the napkin over my neck and under his arm a little below the neck of the humerus, and not in the axilla as is generally practiſed, I directed three men ſtanding behind me to take hold of his wriſt and fore-arm with their hands, and to make an extenſion, beginning gently and increaſing the force gradually, his arm being placed ſomething higher than at a right angle with

his body. As ſoon as I thought the extenſion ſufficient, I preſſed down the acromion and coracoid proceſſes with my hands, I raiſed the os humeri with my neck, and at the ſame inſtant of time I preſſed down the lower part of his arm by gently ſitting upon it, when it immediately ſlipt into the ſocket upon the firſt attempt. Thus the arm was made uſe of as a lever, of which my neck, by aid of the napkin, was the fulcrum. It is to be obſerved that three of the motions were made by myſelf; and it is always of much conſequence that motions which are to correſpond exactly in point of time ſhould be performed by the operator himſelf, more eſpecially when that time is to be regulated by other motions, viz. extenſion and counter-extenſion.

The other caſe was of a ſtrong muſcular man, rather advanced in years likewiſe, who had diſlocated his ſhoulder upwards of three weeks before I ſaw him. The head of the bone lay in the axilla, and many attempts had been been made in vain by

by two different ſurgeons. I firſt ſuſpended him by the wriſt; I then repeated that operation with the arm bent, and the ligatures above the elbow, which I muſt obſerve occaſioned him to make greater complaints than the other method. The heel in the armpit was next tried, but, like the reſt, unſucceſsfully. I then made uſe of the method practiſed in the former caſe, and reduced it with eaſe. This is the method that I have generally uſed with ſucceſs, only with this variation, that in recent diſlocations, where the reduction is not likely to be difficult, I do not uſe the arm as a lever, and therefore do not ſtand before the patient with his arm betwixt my thighs, but either on one ſide, or behind, preſſing down the acromion with my hands while I raiſe the upper part of the humerus with my neck. In this, which I call the common method, the counter-extenſion is, in my opinion, very ſeldom, if ever, properly or ſufficiently made. The hands alone are inſufficient. Cloths, or ſtraps, and bandages of girth-web ſcrewed to a door-caſe, retain the

body indeed, but have very little effect upon the ſcapula. The rolling-pin is trifling. The coul-ſtaff deſcribed by Wiſeman muſt be very painful to the patient, as the ſtaff muſt have a bunch in the middle, ſomewhat wedge-like, and covered with a ſoft bolſter, fit to place under the arm-pit. The cylinder of wood which I recommend, and which my father informs me he has uſed upwards of fifty years, and always found the moſt commodious of all others, ſhould be at leaſt four inches in diameter, and four feet in length, with it's ſurface perfectly ſmooth. The beſt for this purpoſe are to be met with in the calender houſes. When the counter-extenſion is made in this manner by four aſſiſtants, two at each end of the cylinder, the middle of which ſhould be well covered with napkins, the patient will be kept perfectly ſteady, he will find no inconveniences from it, either at the time, or afterwards; and, what is of the greateſt conſequence, it ſo certainly keeps back the lower part of the ſcapula that no accident can alter it's ſituation. It muſt

be

be remembered, that the patient muſt ſit on the floor, and the aſſiſtants employed in the extenſion and counter-extenſion muſt all ſtand ſo as to be above him. If there ſhould be any danger of pulling the patient from his ſeat, he will eaſily be kept down by the ſurgeon's preſſing upon the acromion with both his hands.

An Account of a complete Luxation of the Thigh-Bone, in an adult Perſon, by external Violence. Communicated to the Royal Society, and inſerted in their Tranſactions, Vol. li. part 2.

AS Robert Hogg, a farmer, in Clyfton, about four miles from Manchester, a ſtrong, robuſt, middle-aged man, was taking a load of wheat from off a horſe, on March 20, 1759, his foot ſlipping, he fell backwards, his breech upon the pavement, and the load of wheat upon his belly and thighs. The ſervants carried him into the houſe, and laid him upon a bed, where he remained in the moſt racking torture when I came to him, which was about two hours after the accident happened. I found his right buttock as large again as the other, the knee and foot of the ſame ſide turned inwards, and the thigh much ſhortened. Upon endeavouring to make the thigh perform it's rotatory

tory motion, there was not the leaſt crackling to be heard. This convinced me that the head of the bone was thrown out of the acetabulum; and, upon examination, I could diſtinctly feel it under the glutæi muſcles: to which ſituation of it, and not to any bruiſe, I was now ſatisfied that the ſize of the buttock was owing.

I SOON reduced it by the following eaſy and very ſimple method:

SOME napkins being firſt lapped round one of the poſts at the foot of the bed, to prevent it's galling him, I ordered the patient to be laid on his back, with one leg on each ſide of the poſt, and directed three or four aſſiſtants to pull at the diſlocated limb, the poſt now placed to his groin, being a fixed point to pull againſt. Whilſt they were making this extenſion I clapped my left hand upon the head of the bone, to help it into it's place, and,

at

at the ſame inſtant, with my right hand turning the knee outwards, threw the bone into the ſocket with the greateſt facility imaginable, but with ſuch an uncommonly loud noiſe, as greatly aſtoniſhed all who were preſent. He was perfectly eaſy from that moment, the inlargement of the buttock intirely ſubſided. In a fortnight he was able to move about without aſſiſtance; and, in two months afterwards, walked as far as Mancheſter, being then quite ſound, and the limb which had been diſlocated of the ſame length with the other.

Remarks.

Both ancients and moderns have fallen into great errors, in regard to the treatment of accidents that have happened to the hip joint. The ancients, who, for want of frequent opportunities of diſſecting bodies, were ignorant that the neck of the femur was often broken, always imagined

gined it to be luxated. Their patients were therefore ſometimes tormented, in hopes of a reduction, without any advantage: and this want of ſucceſs made the ſurgeons at other times abandon their patients when they might have been relieved. The moderns have fallen into a contrary extreme, but attended with as bad conſequences. Boerhaave in particular was of opinion, that there never was a diſlocation of the thigh-bone in an adult perſon by any external violence, but that the head of it was intirely broken off at it's neck, near the great trochanter. The opinion of ſo learned a man has had ſuch weight with the generality of the profeſſion, that it has been taken for granted, that in theſe caſes the neck of the bone was always broken, conſequently the reduction was ſeldom attempted, and the unfortunate patients remained cripples during the reſt of their lives. But the point is now, I think, cleared up, beyond the poſſibility of a doubt.

In the second volume of the Memoirs of the Royal Academy of Surgery at Paris there are two cases related, to shew the resources of nature where luxations of the thigh-bone have not been reduced. Here it appears, from examinations after death, that in the first case the bone was thrown out upwards and outwards, the cotyloid cavity greatly diminished in size, and it's figure changed from round to oval. The head of the femur was received into another cavity formed upon the os ilium, under the gluæus minimus, which served it as a capsula, to secure it within this preternatural cavity. The accident was occasioned by a fall, when the patient was a child. She was afterwards able to walk about, though she continued a cripple to the time of her death, which happened at the age of sixty-eight. In the other case the bone was luxated downwards, and inwards, and the head fixed upon the foramen ovale.

THERE is a caſe too related, and very well atteſted, in the Edinburgh Eſſays, philoſophical and literary, vol. ii, of a man at Worceſter, who had the head of the bone thrown out of the acetabulum, and lodged in the groin. It was with ſome difficulty reduced, and the man ſuffered no other inconvenience than that of the diſlocated leg's being almoſt a quarter of an inch longer than the other.

To theſe let me add, that about thirty years ago my father was ſent for to a man, who had luxated his thigh-bone three or four days before. The head of it lay in the groin, which the ſurgeon who was firſt employed did not diſcover: however it was immediately replaced, and the patient recovered the uſe of his limb in a very ſhort time.

FROM what I have ſaid I would by no means have it concluded, that the neck of the bone is not ſometimes broken, or

that it is not even oftener broken than luxated: but from the caſe which has directly fallen under my notcie, joined to thoſe which I have above recited, I think it muſt appear very clear that it has been frequently luxated, and that likewiſe different ways.

A remarkable Diſlocation of the Eye.

C. D. applied to me about ten or twelve years ago, upon account of the following remarkable accident which had juſt happened. As he ſat in company a perſon thruſt the ſmall end of a tobacco-pipe through the middle of his lower eyelid. It had paſſed between the globe of the eye and the inferior and external circumference of the orbit, which is compoſed of the os mali, and was forced through that portion of the os maxillare, which conſtitutes the lower and internal part of the orbit. The pipe was broken in the wound, and the part broken off, which from the examination of the remainder appeared to be about three inches, was quite out of ſight, or feeling; nor could the patient give any account of what was become of it. The eye was diſlocated upwards, preſſing the upper eye-lid againſt the ſuperior part of the orbit; the pupil pointed upwards perpendicularly, the muſculus deprimens was upon the full ſtretch, and the ſight of the eye was intirely taken from him.

I applied one thumb above and the other below the eye, and, after a few attempts to reduce it, the eye ſuddenly ſlipped into it's ſocket. The man inſtantly recovered his perfect ſight, and felt no other inconvenience than that of a conſtant ſmell of tobacco ſmoke in his noſe for a long time after; for, as he informed me, the pipe had juſt been ſmoked in before the accident. About two years afterwards he called upon me to acquaint me, that he had that morning, in a fit of coughing, thrown out of his throat a piece of tobacco-pipe, meaſuring two inches, which was diſcharged with ſuch violence as to be thrown ſeven yards from the place where he ſtood. In about ſix weeks he threw out another piece, meaſuring an inch, in the ſame manner, and has never ſince felt the leaſt inconvenience.

REMARK.

PERHAPS the term *diſlocation*, for which indeed, in this caſe, I have no precedent, may be objected to. I believe we have

here an accident that was never deſcribed by any author, but the eye was certainly as much diſlocated as ever a joint was; and the etymology of the word will undoubtedly bear the application I have given it. I am not at all amazed that the tunica conjunctiva and the muſcles ſhould bear to be ſtretched, without ſuffering any injury; but it is rather ſurpriſing that the optic nerve, after being ſo ſuddenly elongated, ſhould in no reſpect ſuffer, and that the man ſhould recover the perfect ſight of his eye immediately after it's reduction. It was luckily indeed not above half an hour in this unfortunate ſituation; had it been longer, in all probability, the event would not have been ſo happy for my patient.

An extraordinary Tumour on the lower Part of the Orbit of the Eye, thruſting the Eye out of it's Socket, ſucceſsfully extirpated by Dr. Thomas White.

ANN SUTTON was afflicted with a tumour betwixt the zygomatic proceſs and the noſe, ariſing from the lower part of the orbit of the left eye. In two years time it put on a frightful appearance, having grown to ſuch a bulk that it preſſed the noſtrils to one ſide, ſo as to ſtop the paſſage of the air through them, and thruſt the eye out of it's orbit, ſo that it lay on the left temple, yet, though thus diſtorted, it ſtill performed it's office. It occupied the greateſt part of the left ſide of the face, extending from the lower part of the upper jaw, to the top of the forehead, and from the fartheſt part of the left temple to the external canthus of the eye. She at length applied to me for relief. Upon handling the tumour I found an unuſual and unequal boney hardneſs. It was of a duſky livid colour, with varicous veins on the ſurface, and there was a ſoft tu-

bercle projecting near the noſe, where nature had endeavoured in vain to relieve herſelf.

As the poor woman was reſolved to undergo any thing for a cure, I called in four phyſicians to conſult on the caſe, and it was agreed to attempt her relief by an operation. This I performed in the following manner:

I BEGAN with a ſemicircular inciſion below the diſlocated eye, in order to preſerve that organ, and as much as poſſible of the obicular muſcle; then carrying the inciſion round the external part of the tumour, I brought it to the bottom of it, and then aſcended to the place where I began, taking care not to injure the left wing of the noſe. After taking away the external part of the tumour, which was ſeparated in the middle by an imperfect ſuppuration, there appeared a large quantity of a matter like rotten cheeſe, in part covered by a boney ſubſtance, which however was ſo carious as to be eaſily broken through. I ſcooped away abundance of this matter, with a great

great many fragments of rotten bones. Upon cleanſing the wound from blood and filth with a ſponge, I found the left bone of the noſe, and the zygomatic proceſs carious, and eaſily removed them with an elevator. There were no remains of the bones compoſing the orbit of the eye, which were plainly deſtroyed by the ſame diſeaſe. The optic nerve was denuded as far as the dura mater; and the dura mater and pulſation of the veſſels of the brain were apparent to the eye and touch. The left ſuperior maxillary bone, in the ſinus of which this diſeaſe had it's origin, and remained a long time concealed, was ſurpriſingly diſtended, and in ſome places become carious; it had exfoliated from the lower part to the ſockets of the teeth, which part was in like manner removed.

I APPLIED the actual cautery to the reſt of the bones and putrified parts, taking care not to injure the eye, and neighbouring parts, which were ſound. The patient drew her breath through the wound, and was ſo incommoded by the fœtid matter

flowing

flowing into her throat, that she was obliged for several weeks to lie on her face, to prevent suffocation.

NOTWITHSTANDING her miserable condition, nature at length assisted, a laudable pus appeared, sound flesh was generated, and the patient recovered. The eye returned to it's place, and she enjoyed the perfect sight of it. The only inconvenience that remained was a constant discharge of mucus from the greater canthus of the eye, which I could never thoroughly cicatrize.

Dissection

Diſſection of an Arm on which the Operation for the Aneuriſm had been performed.

ABOUT two years ago a woman died in the Lunatic Hoſpital in Manchester, who, about fourteen years before, had undergone the operation for an aneuriſm, occaſioned by bleeding in the right arm, which perfectly ſucceeded. As opportunities of examining the ſtate of the parts after death ſeldom occur, I was determined not to miſs that which now offered. I accordingly injected the axillary artery with wax, and then took the arm off at the joint, and diſſected it. The annexed figure is a true repreſentation of it's appearance.

As I do not recollect to have ſeen or heard of a * preparation of this ſort, I imagine it will not be unacceptable to the public. We may here not only admire the wonderful power of nature in continuing the cir-

* MOLINELLIUS, in the Act Benon. vol. i. part 2, page 72, has given us the hiſtory and a drawing of an aneuriſm ſimilar to this, which he diſſected, but it does not appear that the arteries were injected, or the parts preſerved. I am obliged to Dr. Hunter for this note, as I am not in poſſeſſion of the book.

culation,

culation, when almoſt three inches of the principal artery were obliterated, but ſurgeons may be encouraged never to deſpair of ſucceſs in a ſimilar operation: for in this caſe the humeral artery was tied above it's diviſion into the radial, ulnar, and interoſocal arteries: and the ſmall capillary arteries appear to have undergone ſo great a dilatation, as when taken together, to exceed in diameter the trunk of the humeral artery, which, by their * tortuous anaſtomoſes, they fill again beneath the obliteration.

My worthy friend Dr. Hunter has done me the honour to give this preparation a place amongſt his valuable collections.

PLATE VII.

A fore view and a ſide view of the preparation. The dotted lines at A expreſs the extent of the obliteration of the trunk of the artery.

* For a curious inveſtigation of theſe tortuous convolutions. ſee Dr. Hunter's obſervations on aneuriſms in the Medical Obſervations and Inquiries, vol. ii. p. 411, and Molinellius in the Act. Benon.

An

An Aneuriſm of the Leg occaſioned by a Fracture, in which the Sponge was ſucceſsfully uſed.

ABRAHAM COOK, of Staley-bridge, in Cheſhire, a healthy man, betwixt thirty and forty years of age, on December 25, 1764, had the misfortune to break both bones of his leg. The fracture appeared only ſimple, and went on very well till about ſix weeks after the accident, when a tumour began to riſe on the forepart of the leg, betwixt the tibia and fibula, which in a little time burſt, and poured forth a great quantity of blood. This was the account given by the patient, and the ſurgeon, who was employed when I was ſent for to take off the leg. Upon examination I was convinced that there was an aneuriſm of the arteria tibialis antica. I immediately laid open the whole tumour, which was full of coagulated blood; and after cleaning it away, looſened the tourniquet, which had been previouſly applied, and perceived the orifice in

in the veſſel which lay very deep betwixt the two bones. Upon introducing my finger I alſo diſcovered the cauſe, which was a ſplinter of a bone above an inch long, as ſmall and ſharp pointed as a needle; this I eaſily broke off with my finger, and brought out. The difficulty was now how to ſecure this veſſel. It was impoſſible to uſe a needle, as there was no room to turn it, it was as impoſſible to draw out the artery with any inſtrument on account of it's depth, and it was too large to be truſted to the actual cautery, or to any kind of ſtyptic. That ingenious ſurgeon Mr. Gooch, in a note to his caſes and practical remarks *, p. 136, edit. 1, ſays, " among " the reſt of our chirugical converſation " at this meeting, mention was made of " an accident, in which one of the arteries " between the tibia and fibula was opened " about the middle of the leg, and the bleed- " ing ſtopped from time to time, by various " methods, but at laſt it was thought ad- " viſeable to amputate the limb.

* See likewiſe Gooch's practical treatiſe on wounds, p. 124.

" Upon

"UPON reflection it occurred to me, "that in this case the removal of two or "three inches of the fibula was practica- "ble, and that it probably might have given "a fair opportunity of coming at the "bleeding vessel, and proved the means of "preserving the limb."

THIS thought was truly ingenious, and very probably would have answered: it was certainly worth the trial before that last of resources, amputation, was put in practice; but from my experience of the sponge, I had not the least doubt but that both these operations, in the present case, would be unnecessary. Accordingly I applied a piece of dried sponge to the orifice of the vessel, cut in the manner I have described in my treatise on the use of the sponge; and over that some compresses, and a bandage to secure it firmly in it's situation. The hæmorrhage immediately stopped, but in a few days I was sent for again upon a fresh eruption. On examination I found there were more orifices than one, and that this latter hæmorrhage

was from another totally different from that to which I had applied the ſponge. As this was the caſe, I cut the artery through with a ſmall knife, as high as the uppermoſt orifice, and then applied a piece of dried ſponge large enough to fill the whole ſpace betwixt the bones, when the bleeding inſtantly ceaſed, and never gave us farther trouble.

The blood which had inſinuated itſelf between the muſcles, tendons, and bones, for a large extent, before the tumour was opened, now gave us ſome diſturbance, by occaſioning ſeveral formations of matter, but all difficulties were in a little time overcome, and the man retains the perfect uſe of his leg.

An Hæmorrhage, from a Wound of the Radial Artery, ſtopped by the Sponge.

DANIEL BERTLES, of Alderley, in Cheſhire, a middle aged man, had the misfortune, on October 2, 1762, to cut the radial artery with an ax a little above the wriſt. *Agaric*, *boviſta*, and many other things, were applied by different perſons, and the artery was twice taken up with the needle and ligature, by Mr. Allen, a ſurgeon of reputation at Knutsford, well accuſtomed to the operation. He however did not ſee the patient till the fifth day after the accident. After each of theſe methods the hæmorrhage ſtopped for a few hours, and then frequently burſt out again, eſpecially upon the acceſſion of a hot fit, to which he was now very liable. On the ſeventh day I was called, in conſultation with Mr. Allen, to take off the arm. We found his hand and arm ſwelled to three times it's natural ſize, from the frequent

uſe of the tourniquet, which had been under a neceſſity of being moved to different parts of the arm on account of the excoriations it had occaſioned. For the laſt twenty-four hours it had been applied almoſt without intermiſſion from a dread of his bleeding to death, as he had loſt a prodigious quantity of blood. After the dreſſings and clotted blood were removed, we could diſtinctly ſee the mouth of the veſſel throwing, *per ſaltus*, what I can ſcarcely call blood, as it's colour could hardly be diſtinguiſhed upon linen. I applied a piece of ſponge, in the form of a cone, with it's apex towards the mouth of the veſſel, over that another piece ſomewhat larger, and upon theſe the uſual dreſſings ſecured by a bandage put on extremely ſlack, on account of the ſwelling; as he lived many miles from a ſurgeon we durſt not leave him without ſome little ſecurity, and therefore fixed Petit's tourniquet upon the bandage over the ſponge, upon which it made a ſmall preſſure; and left directions for it to be ſcrewed tighter or ſlacker, as his attendants

ſhould

ſhould find neceſſary. As the arm was ſo much ſwelled Petit's tourniquet was certainly preferable to a tight circular bandage, becauſe it only preſſes in two points, and therefore the preſſure might be increaſed without interrupting the circulation. The tourniquet at the upper part of the arm was left quite looſe. The patient reſted very well till about four o'clock the next morning; when a violent heat and burning came on, with a great pulſation, about the wound, which continued near an hour. Mr. Allen found him aſleep at eight that morning, and quite ſlackened the ſcrew without his perceiving it. He left directions only to tighten it occaſionally, when he moved about. I ſaw him on the fourth day after the application of the ſponge, and, though every thing remained quite ſlack about the wound, not a drop of blood had been diſcharged. I now left him to the care of Mr. Allen, who removed the ſponge in a few days, and he was ſoon well, without any other inconvenience than that of it's being ſome

time before his ſtrength was perfectly recovered *.

* The danger and trouble ſometimes attending wounds of the radial artery, at or near the wriſt, may be ſeen by two caſes related by O'Halloran on the gangrene and ſphacelus, Obſ. 47 and 48, and by Gooch, in his practical treatiſe on wounds, p. 124, and 170, when loſs of limb, and even of life itſelf, has been the conſequence.

An Hæmorrhage, from an Artery of the Eye, ſtopped by the Sponge.

A YOUNG lady conſulted me, about the end of September 1762, concerning a *hydropthalmia* with which ſhe had been troubled from her birth, or ſo ſoon after, that her friends could not be certain about it. It occaſioned a great pain in her head, and the other eye was ſo much affected by it that ſhe was afraid of loſing it likewiſe. It had been opened by a ſurgeon, and intirely ſubſided, but ſoon filled again. I therefore adviſed cutting the cornea intirely out, by a circular inciſion. I began by opening it with a knife, and when the eye was become flaccid, by letting out the water, I then took hold of the cornea with a hook, and, with one ſtroke of the ſciſſars, cut out the whole. An artery that was preternaturally inlarged bled very freely, much more ſo than I expected. I waited as long as I thought was prudent, to ſee if it would ſtop of itſelf, but as it did not, after I had wiped the eye very clean, I introduced

a piece of dry ſponge, and over that the common dreſſings, ſecured by a handkerchief. The hæmorrhage was immediately ſuppreſſed; I removed the ſponge in four or five days; a firm cicatrix formed in about three weeks, and her complaints returned no more upon her. I cannot help remarking, that in this caſe the ſponge ſeemed peculiarly ſerviceable; for as the humours were diſcharged, and the remainder of the eye ſunk in the ſocket, it would not have been eaſy to uſe the needle and ligature. Styptics would have been very painful, and might perhaps have brought on bad conſequences; and as the young lady was of a delicate habit, and her eye exquiſitely ſenſible, ſtrong compreſſion might have been attended with inconveniences.

An Account of the ſucceſsful Uſe of the Sponge, in the Stoppage of an Hæmorrhage, occaſioned by Amputation below the Knee; and of the remarkable Effects of that Application in preventing the Abſorption of Matter.

WILLIAM SMITH, of Buxton, in Derbyſhire, aged twenty, was admitted into the Mancheſter Infirmary for ulcers of the ancle, which were attended with a caries. The abſorption of matter had brought on a cough, colliquative ſweats, a diarrhœa, and an hectic fever, which conſumed him very faſt. His hot fits were extremely violent: they uſually continued more than two hours, and returned upon him daily. When he was moſt free from his fever, and conſequently cooleſt, his pulſe, which was moſt carefully obſerved by a pulſe-watch, beat one hundred and fifty four times in a minute. Many medicines, which proved no more than palliatives, were made uſe of. Amputation was therefore reſolved upon, and

I performed the operation in the uſual place below the knee, on March 20, 1762. Upon ſlackening the tourniquet, the arteries bled freely. After I had again tightened that inſtrument, and wiped the wound with a ſponge preſſed out of warm water, in order to cleanſe it from grumous blood, I covered the whole ſtump with pieces of dried ſponge, applied over theſe the common dreſſings, and retained them on by no tighter a bandage than what was juſt neceſſary to keep the ſponge in contact with the mouths of the divided arteries. The tourniquet was let looſe in about fifteen minutes after the operation. I now recollected that I had omitted to cut the interoſſeous ligament, but as the ſtump was dreſſed, and the patient in bed, I was for the preſent unwilling to diſturb him. In about an hour his hot fit came on, and an eruption of blood ſoon after ſucceeded, but it was immediately ſuppreſſed upon the application of the tourniquet, by a perſon whom I had left in the room. I returned ſoon after, and, removing the dreſſings, diſcovered, as I expected, that the effuſion

of

of blood proceeded from the tibialis antica. I therefore with a knife divided the interoſſeous ligament about half an inch, for the reaſons given in my pamphlet on *The topical application of the ſponge, in the ſtoppage of hæmorrhages*, and re-applying the ſponge, in about a minute afterwards I ſlackened the tourniquet. It appeared however that the ſponge had not time enough to ſecure it's ſituation. For this reaſon it was neceſſary again to tighten the tourniquet. The ſponges, which were ſaturated with blood, were removed, and I applied freſh pieces to the extremities of the veſſels, preſſing that which I had placed upon the tibialis antica tightly down between the ſeparated edges of the interoſſeous ligament. A ſecond piece was applied over this, and a whole undried ſponge was placed to cover both, theſe were all of them retained by four croſs ſlips of good ſticking plaſter, and, to render them ſtill more ſecure, I took a double headed bandage, bended the knee, and, bringing the middle of it to the extremity of the ſtump, paſſed each end ſeveral times

over

over the knee, and back again, making the compreſſion ſomething tighter than uſual. I did not however turn it round any part of the limb, circular bandages, when applied too tight, being frequently prejudicial. In leſs than half an hour the tourniquet was intirely ſlackened, and I had no further occaſion to repeat it's uſe, not the leaſt effuſion of blood ſucceeding. The great heats under which my patient laboured, the thinneſs of his blood, and exceſſive quickneſs of his pulſe, made me think all the precautions I had taken neceſſary. As I was convinced the ſponges muſt have ſufficiently ſecured themſelves, I removed the tight bandage early the next morning, and the ſponges were taken away a fortnight after amputation, not the leaſt difficulty nor any effuſion of blood attending their removal. For ſome time his hectical complaints appeared to be leſs troubleſome, but they grew worſe again, and I attributed their return to the abſorption of matter. To remedy this the *decoct. ſarſap.* was ordered, and I dreſſed the ſtump every day with ſponge, after the manner deſcribed

by

by Mr. Kirkland, in Vol. ii. of Medical Obſervations and Inquiries. In a few days his diarrhœa abated, his heats began to decreaſe, and he was viſibly better, but as it was yet doubtful whether I was to attribute this change to the ſarſaparilla or the ſponge, I intirely diſcontinued the uſe of the latter. In two days time he again began to alter for the worſe, and in leſs than a week was as bad as ever. I repeated the ſponge, all his bad ſymptoms, and particularly his looſeneſs, which had reſiſted the power of many medicines, after a few days began to abate, he gradually continued to mend, and the ſponge was applied as long as it had any wound to cover. He was diſcharged cured upon May 31, and on September 27, when I had laſt an opportunity of ſeeing him, he remained in a tolerable ſtate of health.

I CANNOT help attributing the preſervation of this perſon's life to Mr. Kirkland's method of preventing the abſorption of matter; and as far as a ſingle caſe can be proof of any general doctrine, it has con-

vinced me of the utility of his manner of application. I believe I have ſeveral times ſeen it's advantages, and as I am ſenſible of the difficulty which often occurs in aſcertaining facts, I ſhall always be extremely cautious of building any theory upon the credit of uncertain trials; however, as this application appears to me to be both ſafe and eaſy, and at the ſame time ſeems to be a reaſonable practice, I cannot help recommending it as well worthy the attention of the faculty.

AFTER frequent repetitions of the ſtoppage of blood by the ſponge, it was impoſſible for me not to obſerve that wounds were clearer and freſher * in thoſe places upon

* When I mentioned this circumſtance to a ſurgeon of eminence in London, he aſked me whether it was not owing to the firſt dreſſings having lain longer when the ſponge had been applied, than upon any other part; for that in the hoſpital he had not of late years taken off the firſt dreſſings from a ſtump till the eighth day after the amputation, and found the ſtumps much clearer and better digeſted than when the dreſſings were ſooner removed. I agree with this geetleman

upon which the ſponge had been applied than in any other. This tempted me to make trial of it upon foul ulcers, and in abſceſſes recently opened, and it has fully anſwered my expectation, clearing them with greater eaſe, more expedition, and much more effectually than any other method I have yet ſeen introduced into practice. Moſt foulneſſes are, if I am not deceived, to be attributed to ſharp acrid matter, which lodges itſelf within the cavities of the abſceſſes, and upon the ſurfaces of ulcers. Dry ſponge applied without lint, by it's gentle adheſion, carries along with it whatever is eaſily removed, and the repetition of it takes away the

gentleman that he is right in continuing the dreſſings no matter how long, provided they do not grow offenſive; but I can by no means allow, as I have ſince my converſation with him been more than uſually attentive to this particular, that the effect attributed to the ſponge, is cauſed by the continuance of the dreſſings only; for if ſponge be laid upon one part of the wound, and dry lint upon another, and both the applications removed together, that part of the wound upon which the ſponge hath lain will be conſiderably freſher than the other.

cauſe.

cauſe. If the ſponge be made uſe of to clear foul ulcers, it muſt be perfectly dry, and applied without any lint; but if it be only uſed to prevent abſorption Mr. Kirkland's manner will need no kind of alteration. I muſt beg leave to mention another advantage from the ſponge, which that gentleman has omitted. It prevents the luxuriance of thoſe fleſhy granulations which can ſometimes be no otherwiſe prevented than by bandages or cauſtics. Theſe it keeps down, partly by a removal of that matter in which they would otherwiſe be conſtantly ſoaked, and partly by a compreſſion the moſt eaſy and equal that can poſſibly be imagined, from the natural elaſticity of the ſponge.

An Account of an Hæmorrhage, from an Artery in one of the Tonſils ſtopped by Ligature.

A GENTLEMAN of about forty years of age, having had a violent inflammation of his tonſils, one of them gathered and burſt, and the diſcharge of matter was ſucceeded by a conſiderable quantity of blood, which he threw out of his mouth, but from whence it proceeded both he, and the perſons who were with him, were at a loſs to determine. I inſpected his throat, and diſcovered that it came from an artery ſituated upon the tonſil, which the matter had corroded.

I ORDERED aſtringent gargles, and applied the moſt powerful ſtyptics. The effects of theſe remedies were of ſhort duration. I tried the actual cautery, and repeated it ſeveral times with no better ſucceſs. Loſs of blood had rendered my patient ſo weak that his friends, as well as myſelf were very much alarmed. I therefore

fore attempted the ſecuring the veſſel by ligature.

To effect this I paſſed the needle * uſually employed in the extirpation of indurated tonſils, armed with a double thread, through the edge of the tonſil cloſe to the bleeding artery, then, by the help of an hook, laying hold of that part of the thread which had been paſſed through the tonſil, I brought it out of the mouth, and withdrew the needle. I now, by the aſſiſtance of the *tonſil inſtrument* †, held one end of the thread upon the ſide of the tonſil next to the throat, and making the knot by pulling at the other, included the bleeding veſſel in it. By theſe means it was perfectly ſecured, and gave us no further trouble.

* This needle is fixed in a wooden handle, and has an eye at it's point.

† This inſtrument has a ſmall ring at the end for the thread to paſs through, and was contrived by the late Mr. Cheſelden.

I DO not know whether I have explained myſelf ſufficiently to perſons not converſant in matters of this nature, but I believe I ſhall be well enough underſtood by thoſe who are acquainted with the method of extirpating by ligature ſuch ſchirrous tonſils as are of a conical form; the ſame inſtruments, and nearly the ſame means, here made uſe of, being employed for that purpoſe.

REMARK.

IN all ſpittings of blood we cannot be too inquiſitive in regard to the part from whence the blood proceeds. I have frequently known patients, and ſometimes thoſe of the faculty, miſtake hæmorrhages from the mouth, throat, and back part of the noſtrils, for a true hæmoptoe, which hæmorrhages may be generally remedied by topical applications. In the preſent caſe, if the ligature had failed, an inſtrument might have been contrived which would have made a conſtant preſſure upon the

part, and would in all probability have ſtopped the bleeding artery.

I ONCE met with a very conſiderable hæmorrhage, after an amputation of the penis of a poor man in the Infirmary, which reſiſted many applications. I perceived that the blood flowed not from any particular veſſel, but from the whole ſubſtance of the corpora cavernoſa, and from the ſpongy part of the urethra, therefore having firſt introduced a canula into the urethra, and ſtripped back the ſkin, I paſſed a needle, armed with a double thread, through the corpora cavernoſa, and, dividing the threads, tied one part above and the other below, by that means included the corpora cavernoſa and the urethra in the ligatures, which perfectly anſwered the end. I let the ligatures remain about twenty-four hours, when I cut them without any hæmorrhage, or any other inconvenience enſuing, and my patient ſoon recovered.

I HAVE been informed that ſome little while ago a perſon, at Newcaſtle upon Tyne,

Tyne, had the misfortune to have the humeral artery wounded by a lancet in bleeding. Mr. Leighton, and afterwards Mr. Lambert, two ſurgeons of eminence in that town were conſulted. They agreed that the operation for the aneuriſm was neceſſary, which was performed, and the artery ſecured by the pin, and twiſted ſuture, according to the method deſcribed by Mr. Lambert in vol. ii. of the Medical Obſervations and Inquiries, but in a few days a violent hæmorrhage enſued. Upon the failure of this method ligatures were tied round the trunk of the veſſel, both above and below the orifice, in the uſual way, which reſtrained the bleeding for ſome time, but it afterwards burſt out again with great violence. Sponge was now applied to the bleeding artery, which being aſſiſted by compreſſion, effectually ſtopped the hæmorrhage, and never afterwards returned. I do not find that any difficulties occurred after the application of the ſponge except in the removal of it, when ſome ſmall particles remained behind, which were however

perfectly healed over without any inconvenience.

For further particulars of this case I must refer the readers to the next volume of Medical Observations and Inquiries, in which I hope the public will be favoured with it, as Mr. Leighton informs me he has promised it to Dr. Hunter for that publication.

I have only to observe that in the use of the sponge I never found that compression was necessary longer than five hours after it's application; but if for the greater security it should be thought expedient to continue it for the first night, that will certainly be long enough; and if the directions I have given be attended to, in the choice of the sponge, in the manner of cutting it before, and removing it after it's application, I believe no difficulties will arise worth notice, in regard to the removal of it, especially if it is not permitted to remain on too long; at least I can assure the public that I have not met with any

ever ſince I publiſhed an account * of the manner of applying it, though I have uſed it ſince that time to great numbers of patients. I do not mean to ſay that it can, in many caſes, be removed abſolutely without pain, I know that we cannot remove lint, or even touch a freſh wound, without giving pain in ſome degree.

* VIDE an account of the topical application of the ſponge.

CONCLUSION.

I MADE uſe of the ſponge for the ſtoppage of hæmorrhages in all caſes indiſcriminately for near three years, in which time there were nineteen amputations of the larger extremities, ſix of which were of the thigh, and moſt of the principal operations of ſurgery, as lithotomy, caſtration *, bubonecele, the trepan, ſchirrous and

* AFTER the diviſion of the ſpermatic arteries I have generally found the method which Mr. Warner recommends ſufficient. He ſays, in his caſes in ſurgery, p. 255, "The only method I have of late years made "uſe of for ſtaunching the blood, after the extirpa- "tion of the teſticle, is by making a gentle com- "preſſion of the veſſels, for a few minutes, betwixt "my thumb and fore finger; afterwards the applica- "tion of a bit of lint to the mouths of the veſſels has "effectually anſwered the intention, without giving "the leaſt degree of pain, which ſhould be avoided "as much as poſſible in this and every other operation "in ſurgery, when it can be done with ſafety."

cancerated † breasts, and encysted tumours, besides many accidental wounds, and violent hæmorrhages from the extraction of teeth, where it was peculiarly serviceable, and after the application of leeches. In all these trials it never failed me, except in one instance, which was after amputating the thigh of a young gentleman, who had a white swelling in the knee, attended with constant convulsive twitches in his leg and thigh so great as to raise the limb every five minutes from the pillow. These twitches continued after the operation, and would never allow the sponge to adhere. After some ineffectual trials of it, I secured the femoral artery with the needle and ligature, and the patient went on very well for three weeks, so as to be able to sit up many hours in a day, to read and write, and play on the flute, but about the expiration of that time he was seized with

† In hæmorrhages proceeding from those ulcerated tumours, called bleeding cancers, the fungus vinosus, which is to be met with on old casks in Wine Vaults, is the best application I know of.

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the ſymptoms of a locked jaw, and died in a few days.

NOTWITHSTANDING all theſe caſes in it's favour, there is one inconvenience attending it's uſe in very large arteries, which is it's uncertainty for a few hours after it's application, ſo that I never durſt truſt it without it's being narrowly watched for ſome time; but after four or five hours were expired, I always thought it perfectly ſecure, even more ſo than the needle and ligature.

UPON hearing of * Mr. Bromfeild's ſucceſs in drawing out arteries with the tenaculum, and including the veſſel alone in the ligature, I was induced to try this practice. In the large arteries which are ſurrounded with a good deal of cellular ſubſtance, the veſſel may eaſily be drawn

* I MUST take this opportunity of acknowledging my obligations to Mr. Bromfeild, for communicating to me, by letter, this method of ſecuring the blood veſſels.

out

out alone; and here too much cannot be ſaid in favour of this method, which is totally free from pain, and from the inconvenience attending every other mode of practice. But the ſmall arteries ſituated amongſt the muſcles can ſeldom or ever be drawn out without ſome of the fibres of the muſcles with them, the tying of which muſt neceſſarily be attended with pain. Yet here I even think it preferable to the needle; however, if I may be allowed to judge impartially, the ſponge deſerves the preference over every other method, wherever the ſmaller arteries are divided, in ſuch caſes where the larger arteries cannot be taken up by the tenaculum or needle, or where the fleſh is become ſo tender as to give way to the ligature.

It may be thought that I conclude the needle of no uſe, but I ſhould be ſorry to be debarred the practice of it, as occaſions may offer where it may be ſerviceable, and it is always right to be provided with more remedies than one.

In

In regard to the means which nature employs in the ſtoppage of hæmorrhages, from divided arteries, I never thought Petit's theory of coagulum at all probable. A coagulum of blood formed at the end of an artery is ſo far from being of any ſervice, except in ſome few caſes where the air cannot get admiſſion, that it is abſolutely prejudicial, as I have often obſerved, and ſhould always be removed before the application of ſponge, or any fungous ſubſtance.

Pouteau's hypotheſis, that the ſwelling of the ſurrounding cellular ſubſtance cloſes the artery, ſeemed more probable; but I am now convinced, from ſeveral obſervations, that, according to the ſuppoſition of Mr. Gooch, ſince confirmed by my ingenious friend Mr. Kirkland, the arteries, by their natural contraction, coaleſce as far as their firſt ramification. The following caſes are good proofs of this doctrine.

An

An old woman had a compound fracture of the fore-arm, by which the tendons were lacerated, and the joint at the wriſt much ſhattered. In three weeks after the accident ſhe was ſeized with great pain, and with convulſions and ſpaſms in her right leg, from whence I judged it proper to amputate in the middle of the fore-arm without further delay. The arteries were ſtopped with ſponge. The ſpaſm in the leg however continued, and was followed by others all over her, and ſhe died convulſed on the twenty-ninth day after the accident, and the eighth from the operation. I was deſirous of ſeeing in what ſtate the arteries were after the uſe of the ſponge, and for this purpoſe laying bare the humeral artery, I cut it open to the place where it divides into the radial and ulnar branches. I then introduced a common ſilver probe into each branch, which paſſed very eaſily to a certain point, which ſeemed about an inch from the extremity of the ſtump, but could go no further. I then uſed briſtles, and puſhed them with all the force they would bear, but they

ſtopped

ſtopped at the ſame place. I next laid open the arteries to their extremities, and found them intirely cloſed, near an inch from the end of the ſtump; but from that point upwards their capacities were not at all diminiſhed, nor was there any coagulum or clot of blood in the veſſels, or any where near them.

In the arm I have by me, on which the operation for an aneuriſm had been performed, (ſee Page 139, Plate VII.) it is plain to a demonſtration, by the injection, that the artery was cloſed both above and below the ligature to the next lateral branch: and it is not likely that the ſurgeon who performed the operation ſhould have made his ligatures at ſo great a diſtance from each other as three inches.

Pl. VII.

AN

ESSAY

ON THE

LIGATURE of ARTERIES.

BY

J. AIKIN, Surgeon.

TO

Mr. Charles White, F. R. S.

DEAR SIR,

THE following little eſſay having been favoured with your approbation, I take the liberty of putting it under your protection; that, being uſhered into the world along with your very valuable publications, it may meet with that notice which the obſcurity of a young author would not otherwiſe entitle it to.

I SHALL ever eſteem it a moſt fortunate circumſtance of my life, that I received my education under a gentleman who has the improvement of his profeſſion ſo much at heart. If I have imbibed any of this ſpirit, to you

I am greatly indebted for it. I therefore beg leave to inſcribe to you this firſt fruit of my ſtudies, as a ſmall teſtimony of gratitude and eſteem; and to aſſure you that I am, with great ſincerity and friendſhip,

Dear SIR,

Your obliged humble ſervant,

MANCHESTER,
1769.

JOHN AIKIN.

ON

ON THE

LIGATURE of ARTERIES.

IT may perhaps ſeem a needleſs taſk to attempt any farther diſcuſſion of a ſubject which has exerciſed the talents of men of the greateſt eminence in our profeſſion. And, indeed, if what I had to offer were only a matter of theory, or barren ſpeculation, I ſhould ſtand greatly in need of an apology for obtruding my ſentiments on the public, in oppoſition to thoſe of perſons, whoſe knowledge and acuteneſs of genius are much ſuperior to what I can pretend to. But an improvement in a point of practice does not require ſuch an apology. It's importance to mankind fully juſtifies an attempt to make it general: and a man of very mo-

derate abilities may be ſerviceable to the world, by relating what has been the object of his experience and obſervation.

It is merely this merit of information that I aim at in the preſent eſſay. The practice recommended in it is ancient, and has been revived by ſeveral ſurgeons in their own practice: but none that I know of have publicly ſhewn it's advantages. It is my deſign to ſet theſe in a clear light, by arguments drawn both from theory and experience; and I hope for that countenance from the public, which my intentions deſerve.

I shall begin with a few phyſiological obſervations upon arteries, taking the illuſtrious Haller for my guide.

An artery is a firm elaſtic tube, void of ſenſibility, and without manifeſt irritability.

As muſcular fibres however may evidently be traced in the larger arteries, which in other parts of the body are univerſally known

known to be irritable, it ſeems unreaſonable intirely to deny irritability to arteries.

Arteries are certainly poſſeſſed of a contractile power. This may either proceed ſimply from the elaſticity of their texture, or from the action of their muſcular fibres when irritated.

Arteries may therefore be conſidered in a double view in their action of propelling the blood; either as ſimple elaſtic tubes, the natural diameter of which being dilated by the blood, thrown in from the heart, they continually tend to overcome this dilatation, and return to their natural ſtate; or as ſuſceptible of an irritation from the diſtending blood, which excites the muſcular fibres to act, from whence proceeds a real vital contraction, ſimilar to that of the heart and other hollow viſcera.

The contractile power proceeding from their elaſticity is certain and demonſtrable, remaining ſtrong even after death; that

proceeding from irritation can only be inferred from analogy and circumſtantial arguments.

HALLER, after bringing arguments to prove the vital contractile power of arteries, concludes with ſpeaking very dubiouſly concerning it: "His ſi addideris, &c. "non erit, cur omnino vitalem etiam "vim contractilem arteriis deneges."

Element. Phyſiolog. tom. 1, *p.* 72.

LET us now conſider what muſt follow upon the total diviſion of an artery.

THE dilatation, or, in other words, the pulſation of arteries, is occaſioned not ſo much by the *quantity* of blood expelled from the heart at each contraction, as by the *impetus*, which urges the blood nearer the heart to flow ſwifter than it does at a diſtance, where it is continually delayed by the friction of the numerous ramifications. By this means the blood not being able to flow off ſo quickly as it flows in, is obliged to dilate the arteries for more room

room, which, again contracting, give a freſh motion to the blood. Now when an artery is divided, the blood, no longer meeting with the obſtacle of the innumerable ramifications below the diviſion, flows off freely; whereby the cauſe of the dilatation of the artery is much leſſened. This allows it's contractile power to act more forcibly, and with longer continuance; and the truncated extremity of the artery being deprived of the ſupport of the part below it, the contraction is determined to it, as to a point. This, with perhaps the effect of the cold air in ſtimulating the artery to contract, and agglutinating it's orifice with coagulated blood, proves ſufficient in general intirely to cloſe a ſmall artery, and greatly to diminiſh the ſtream of a conſiderable one. The contraction having once overcome the impetus of the blood, continues to act with greater and greater advantage, till, as has been found by experiment, the artery cloſes ſome diſtance above the truncated extremity.

WHETHER this theory be juſt or not, the fact is certain: that arteries cloſe by their own natural contraction, and not by a coagulum formed in the truncated extremity. The doctrine of a coagulum has been ſufficiently refuted by the experiments of Mr. Pouteau, Mr. Kirkland, and others; and Mr. Kirkland has brought the ſtrongeſt proofs that the *contraction* of arteries *alone* is the chief agent in ſuppreſſing hæmorrhages. I cannot therefore ſubſcribe to Mr. Pouteau's opinion, who aſſigns this office to the tumefaction of the parts ſurrounding the artery. For it is to be conſidered that

FIRST, Arteries frequently cloſe of themſelves much ſooner than any tumefaction can take place.

SECONDLY, Some thin membranous parts are not ſuſceptible of ſuch a tumefaction as would give an effectual lateral preſſure upon the arteries, yet we do not find hæmorrhages particularly difficult to ſuppreſs in them.

THIRDLY,

THIRDLY, The ſucceſs of the artificial means to ſuppreſs hæmorrhages, as perpendicular preſſure, the application of fungous ſubſtances, &c. does not agree with this theory.

FROM theſe arguments I think we may fairly infer, that, although it may eaſily be conceived that the tumefaction of the ſurrounding parts is capable of cloſing an artery, yet that it is at moſt but an auxiliary aid, and what nature is able to diſpenſe with, and therefore is not the object to which art ought principally to be directed.

WE have now ſeen what nature attempts towards the cloſing an artery. It's efforts in an artery of conſiderable ſize are generally ineffectual. I think myſelf ſufficiently authorized to take for granted that ligature is the moſt efficacious of the artificial means to ſuppreſs an arterial hæmorrhage.

THE action of a ligature is immediately to form a ſtrong barrier to the impetus of the

the blood. When this is effected, the caſe is much the ſame as in an artery cloſed by the efforts of nature. The contractile power continues to act above the ligature, the artery cloſes for ſome length, and, in proceſs of time, it's ſides firmly adhere to each other. Neither is this obliteration of the inferior part of the artery long in taking place. Mr. Kirkland, in ſeveral experiments upon brutes, found the arteries in a day or two ſtrongly contracted a conſiderable way: and in a caſe of the humeral artery tied for a ſpurious aneuriſm, on the third day the pulſation could not be perceived nearer to the ligature than an inch and half. Mr. Pouteau, *Melanges de chirurg. p.* 310, cites a caſe of amputation in the arm, where the ligature cauſed ſuch violent pain that it was neceſſary to cut it an hour after the operation, and yet no hæmorrhage enſued. It is ſomewhat remarkable that Mr. Petit quotes a ſimilar caſe, as a proof of the ſpeedy formation of a coagulum; Mr. Pouteau, on the other hand, aſks if it is not much more probable that the cloſing of the artery was owing

to

to the tumefaction of the cellular ſubſtance; and cites this caſe as a confirmation of his doctrine. I am obliged to differ from them both, and attribute it to the natural contraction of the artery: for, in my opinion, it is neither probable that an hours ſpace could be ſufficient for the production of a coagulum, ſtrong enough to reſiſt the impetus of the blood in ſo large an artery, nor that a tumefaction ſufficient for this purpoſe could be ſo ſoon brought on. For though, as Mr. Pouteau obſerves, the pain would aſſiſt the tumefaction, yet when the cauſe was removed, the ſwelling would certainly abate in the part that had been incloſed by the ligature, and no other remain than the general tumefaction of the ſtump; which could not be at all conſiderable at that time.

HAVING now conſidered the manner in which nature acts in cloſing an artery, and how it is aſſiſted by ligature, I proceed to the practical part of this little eſſay, which is to attempt to prove the advantages

advantages of tying the artery *alone*, without any of the ſurrounding fleſh; and to anſwer the objections that have been made to this practice.

Mr. Kirkland has taken a good deal of pains, and with ſucceſs, to obviate many of the objections uſually made to the uſe of the needle. He ſeems ſufficiently to have proved the *efficacy* of this method of ſecuring arteries; and that it is not liable to produce thoſe violent ſymptoms of irritation which have been charged upon it. He is however obliged to confeſs that the pain attending it's uſe is conſiderable; and to this we may add, that in many caſes it's application is difficult and troubleſome. Various other objections might be ſtarted; as, the danger of puncturing a nerve with the point of the needle; of puncturing an artery in the neighbourhood of that we are attempting to ſecure, or even the ſame if it runs obliquely, in which caſe it would be very difficult to ſtop the hæmorrhage; theſe, I ſay, and others might be inſiſted on, but the *pain* alone cauſed by this method

thod, will, I doubt not, be a ſufficient inducement to a ſurgeon to reject it in favour of another, equally ſafe and leſs painful.

It is plain, from Parey's works, that his firſt method of tying arteries was to draw out the artery *alone* with a pair of forceps, and then put a ligature round it. He does not indeed appear particularly ſenſible of the advantage of this method; for he ſays, we need not be very anxious to draw out the artery intirely free from the ſurrounding fleſh, as it will rather tend to ſtrengthen the ligature, to include ſome of the neighbouring parts. I ſhall not ſpend much time in accounting for the reaſons which induced him afterwards to change his method, and other perſons to follow his example. Little can be inferred from the variations of practice, at a time when ſurgery was rather a mechanic art than a regular ſcience, founded upon the certain grounds of anatomy and phyſiology. When the noble invention of tying arteries was firſt practiſed, it found numerous adverſaries, who, from prejudice or envy,

were

were ready to catch at any accidental inſtance of want of ſucceſs. This would lead the firſt followers of the practice to guard very carefully againſt any failure that might injure their reputations; and as the moſt obvious cauſes of a returning hæmorrhage were the ligature ſlipping off, or cutting through the artery, they would naturally attempt to obviate both theſe accidents by taking in a quantity of the ſurrounding fleſh.

This is all that ſeems neceſſary to be ſaid concerning the diſuſe of a method, which, as the moſt obvious and ſimple, was the firſt that was practiſed. It remains for me to prove, that, notwithſtanding all objections, the ligature of the artery *alone* is perfectly ſecure, eaſy in practice, and leſs productive of pain, or other diſagreeable ſymptoms, than the ſuppoſed improvement of the uſe of the needle.

An artery, by the firmneſs and elaſticity of it's texture, and it's want of ſenſibility,

is

is as little liable to injury from ſtricture, as perhaps any part of the human body.

THOUGH it be certain that intercepting the courſe of the nutritious juices into any part, will bring on the deſtruction and mortification of that part, yet a firm and elaſtic texture will, for a conſiderable time, reſiſt the impreſſion of a ligature, which is not extraordinarily tight, and adapted to cut. Now, the natural contractile power of arteries being ſo great, a ligature of very moderate tightneſs will prove ſufficient to reſtrain the force of the blood, till the artery cloſes ſo effectually as to render a return of hæmorrhage impoſſible; and the larger the artery, the longer it will reſiſt the impreſſion of the ligature. It is of importance to attend to this circumſtance; for the chief caution to be obſerved in tying an artery alone, is, not to draw the ligature too tight; the effect of which is greatly to weaken the artery by ſeparating it's circular fibres. Dr. Hunter has found by experiment, that when an artery is tied very

very tight, it is apt to burſt in throwing in an injection, whereas, when the ligature is of moderate tightneſs, it will reſiſt almoſt any force.

Mr. Pouteau, who from his theory of the tumefaction of the ſurrounding parts being the chief agent in cloſing the arteries, is neceſſarily an advocate for very extenſive ligatures, has ſaid all in their favour that an ingenious man can ſuggeſt. He argues, that unleſs a large portion of fleſh be taken in, the compreſſion of the ligature will cauſe a putrid ſolution of the ſubjacent parts, that may ſpread to the coats of the artery. This argument however rather concludes againſt taking in the fleſh at all; for, if a large portion be included, the ligature muſt be drawn tight, otherwiſe the exhalation of the juices at firſt, and the ſuppuration afterwards, will looſen it ſo, that it will not compreſs the artery ſufficiently, as has frequently happened; if it be drawn very tight, the event that Mr. Pouteau apprehends may take

place. Certainly, neither of theſe circumſtances is much to be feared in tying the artery alone, as it's texture will undergo very little alteration from the firſt making the ligature till all danger of bleeding be over.

THE whole of the queſtion comes at laſt to this; whether a ligature, upon the naked artery, be capable of reſtraining the impetus of the blood, till the natural contraction of the artery cauſes ſuch an obliteration of it's extremity, as to render the eruption of the blood impoſſible? If this be proved, it will readily be granted, that all attempts to increaſe the tumefaction of the ſurrounding parts are to be avoided, as unneceſſary, painful, and injurious.

BUT, as theoretical reaſoning upon a matter of ſuch importance is very inſufficient, I ſhall haſten to the facts, a knowledge of which alone induced me to addreſs the public upon this ſubject.

A LARGE artery may, with great eaſe be drawn out intirely free from the ſurrounding parts, and tied, abſolutely without pain to the patient. This may be performed with various inſtruments. The common diſſecting forceps are very proper for this purpoſe; as alſo an inſtrument, a figure of which is given in Cheſelden's appendix to Gataker's tranſlation of Le Dran's operations, tab. 13, where it is called, "an inſtrument convenient to "lift up the end of any ſmall veſſel to be "tied, that lies in looſe membranous "parts." This I have been told was firſt uſed for drawing out the large arteries in the manner this eſſay is deſigned to recommend, under the name of a *tenaculum*, by Mr. Bromfeild.

A SMALL artery cannot be drawn out ſo perfectly free from the ſurrounding fleſh. It is not however difficult, with the help of the tenaculum, to draw it out ſo as to tie it with eaſe, and with much leſs pain than the needle gives. For my own part,

however, for the ſake of avoiding pain as much as poſſible, I would rather chuſe to truſt the ſmall arteries to lint and flour with compreſſion, or fungous ſubſtances, of which, from the moſt undoubted evidence of facts, the *ſponge* is to be preferred for ſecurity and efficacy.

It is no inconſiderable advantage of this method, that the ligature always ſeparates ſoon, and without any trouble; whereas, when the needle is uſed, the tedious ſeparation of the ligature is frequently the cauſe of many inconveniencies, often giving riſe to abſceſſes and ſinuous ulcers. I have been informed of a caſe in which even the patient's death appeared pretty evidently owing to this circumſtance.

This is the method of tying arteries, which, for ſeveral years paſt, has been practiſed by the ingenious ſurgeons of the *Mancheſter Infirmary*; in which, from the frequency of amputations, on account of diſeaſed joints, the faireſt trial has been

given of it's efficacy. During this whole time a needle has never been uſed in ſecuring an artery after an operation, except in a very few caſes, where, from the bad ſituation of the artery, or ſome other uncommon circumſtance, it could not be drawn out ſo as to be tied; and I can, with the ſtricteſt truth, aſſure the public, both from what I have been three years an eye-witneſs of, and from the moſt reſpectable teſtimony of others, that there has not been a ſingle inſtance of returning hæmorrhage, after an artery had been once fairly tied in this method.

THERE ſeems no reaſon to doubt that the ſame ſucceſs would attend taking in the artery *alone*, where it is not divided; as in the operation for the aneuriſm. What inſtances I have ſeen proved equally favourable to it. Mr. Pouteau, indeed, relates two or three caſes of the hæmorrhage returning from the place of the ligature, where the artery had been tied naked. I ſhall not call his facts in queſtion,

but

but where the number of oppoſite facts is ſo much greater, it ſeems but reaſonable to attribute the want of ſucceſs in his caſes, either to too great a tightneſs and ſlenderneſs of the ligature, or to ſome other cauſe, which will not affect the advantages of this method when properly executed.

After having ſhewn the ſecurity of this method of tying arteries, the eaſe with which it is performed, and the advantage it poſſeſſes, of being attended with no pain at all, in ſome caſes, and but little, comparatively ſpeaking, in others, it ſeems almoſt unneceſſary to add, that it is exempted from all the inconveniencies, whether real or imaginary, attending the uſe of the needle. A ſtricture made upon an inſenſible part, cannot poſſibly occaſion thoſe affections of the nervous ſyſtem which have been charged upon the ligature of the nerves, and ſenſible parts along with an artery; and experience fully juſtifies what theory would lead us to ſuppoſe on this head. In ſhort, I

am

am well convinced, that if this method of tying the large arteries eſpecially, was generally practiſed, there would be no longer room for accuſing this part of ſurgery of cruelty, nor any need of having recourſe to a variety of boaſted ſpecifics and ſecrets, which at all times are a diſgrace to a liberal and uſeful profeſſion.

F I N I S.

Explanation of PLATE I.

Fig. 1.

a. An hollow artificial leg made of tin, and covered with thin leather.

b. *c*. Longitudinal ſteel bars, to be made of tough ſtuff, and as light as poſſible, with ſufficient ſtrength.

d. A moveable joint, to be placed exactly oppoſite to the knee joint.

e. A ſteel bow, made thin and elaſtic, to paſs about two thirds round the lower part of the thigh, and fixed with ſtraps of leather, to buckle on the fore part. — There is likewiſe another leather ſtrap below the knee, which buckles on the outſide.

Fig. 2.

Repreſents an artificial leg made in the ſame manner, with the addition of a foot made of light wood, and moveable joints, ſo as to imitate pretty nearly the natural motions of the joints of the ancle and of the toes.

PLATE II.

Repreſents, in two different points of view, a leg on which amputation had been performed, with a flap, a little above the ancle joint.

PLATE VI.

FIG. 1.

That part of the bone which was ſawed off.

a. The head of the bone corroded by the matter.

FIG. 2.

The piece of bone which exfoliated. Both pieces together were five inches in length, four of which were of the whole ſubſtance.

FIG. 3.

The arm, as it appeared after the wound was healed.

a. The cicatrix of the firſt inciſion.

b. b. b. The cicatrix of the inciſion, made to bring out the head of the bone.

N. B. The drawings from which this plate was engraved were made by Mr. Aikin, my pupil, who attended at the operation, and during the whole cure.

ERRATA.

Page.	line.	
13	17	*for* ſeiſed *read* ſeized.
19	5	*for* off *read* of.
28	18	*after* of *read* the.
41	7	*dele* than.
47	13	*for* aſtragulus *read* aſtragalus.
	14	*for* os calcis upon the loweſt *read* ſame bone upon the inferior.
60	17	*for* cannot *read* can, not.
64	14	&c. *read* " In univerſum in ſanguine ma- " teries eſt, apta producendo oſſi, quæ " adeo frequenter in celluloſum ſpa- " tium intimum, interque convexam " ſuperficiem membranæ intimæ arte- " riarum concavamque membranæ muſ- " culoſæ extremitatem effunditur, & " caſeoſa primo, inde calloſa, quaſi " coriacea, demum oſſeæ ſquamæ fit " ſimillima." Halleri Elem. Phyſiol. tom. viii. p. 316.
75	10	*after* with *read* the.
79	16	*for* than *read* that.
83	penultim.	*after* father *read* has.
89	ultim.	*after* unite *put a full ſtop.*
90	1	*read* If the fracture be long of ſtanding, the.
	5	*for* roughened *read* roughned.
96	16	*for* could *read* would.
99	2	*after* in *read* the
109	8	*for* diſlocation *read* reduction.
125	7	*for* inlargement *read* enlargement.
	8	*for* intirely *read* entirely.
127	13	*for* gluœus *read* glutœus.
129	3	*for* notcie *read* notice.
136	12	*for* obicular *read* orbicular.
140	7	*for* interoſocal *read* interoſſeal.
149	21	*for* inlarged *read* enlarged.
173	9	*for* have by me *read* injected.